Hospital Library

The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

Official Organ of The Massachusetts Medical Society
The New Hampshire Medical Society — The Vermont State Medical Society
The New England Surgical Society — The Boston Surgical Society, Inc.
The New England Pediatric Society — The New Hampshire Surgical Club
The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 210 Number 16 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | APRIL 19, 1934 | Published Weekly in Boston at 8 The Fenway

CONTENTS

NEW ENGLAND SURGICAL SOCIETY

Cancer of the Breast: End-Results Massachusetts General Hospital 1921, 1922, and 1923. *Robert B. Greenough* and *Grantley W. Taylor* 831

Cancer of the Breast: End-Results Massachusetts General Hospital 1924, 1925, and 1926. *Channing C. Simmons, Grantley W. Taylor,* and *Richard H. Wallace* 836

Observations on the Problem of Maternal Mortality. *Edward S. Brackett* 845

Health Insurance in England. *Henry B. Brackenbury* 851

Snapping Thumb in Childhood. *Henry W. Hudson, Jr.* 854

Strangulated Inguinal Hernia, with Unusual Complications, in an Infant of Five Weeks. *J. L. Golden* and *H. H. Hamilton* 857

The Mechanism of a Sprained Ankle. *Alexander P. Aitken* 858

A Comfortable Breast Swathe. *Ernest M. Daland.* 859

The Heel Shifting Operation for Flat Feet,—and Others. *Frederic Jay Cotton* 860

(Contents continued on next page)

THE NEXT ANNUAL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY WILL BE HELD IN WORCESTER, JUNE 4, 5 AND 6, 1934, AT THE HOTEL BANCROFT.

ON DISPLAY

The New

SCIALYTIC SHADOWLESS OPERATING LIGHTS

COME in and see why this new Scialytic Light with its seven new and exclusive features represents the most economical and efficient operating light yet developed. See also the new FLASH model, giving absolute insurance against the dreaded emergency—failure of lights in the operating room.

E. F. MAHADY CO.

New England Agents for Scialytic Lights

851-857 Boylston Street **Boston, Mass**

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL
Case 20161—George W. Holmes, Donald S. King, Tracy B. Mallory, Arthur W. Allen, Frederick T. Lord, Edward D. Churchill, Chester M. Jones and others. Case 20162—George W. Holmes, Chester M. Jones, Edward D. Churchill, Tracy B. Mallory and others..... 862

EDITORIALS
A Challenge to the Medical Profession..... 869
Iodine as an Antiseptic..... 869
The Records of Maternal Deaths..... 870
The Recent Survey of Boston's Health Department. 870
This Week's Issue..... 871

BOOK REVIEWS
Les Arachnoïdtes Spinales Adhésives. Dem. Paulian and D. Turnesco..... 882
Blood Pictures. An Introduction to Clinical Haematology. Cecil Price-Jones..... 882
Collected Papers of the Mayo Clinic and the Mayo Foundation. Volume XXIV, 1932..... 881
Diseases of the Nervous System. W. Russell Brain. 880
Infections of the Hand. Allen B. Kanavel..... 880
Manual of Urology. R. M. LeComte..... 880
Public Health Nursing in Industry. Violet H. Hodgson..... 881
The Science of Human Reproduction. H. M. Parshley..... 881
The Surgical Clinics of North America. Volume 13, Number 5, October, 1933. Chicago Number..... 882
The Surgical Clinics of North America. December, 1933. Volume 13, Number 6. Pacific Coast Surgical Association Number..... 881

BOOKS RECEIVED FOR REVIEW..... 882

CORRESPONDENCE
Articles Accepted by the American Medical Association Council on Pharmacy and Chemistry.... 876
Diphtheria Prevention. Henry D. Chadwick, William H. Robey and Dwight O'Hara..... 874

MISCELLANY
Dairy Scientists Perfect Method for Recovering Milk Albumin for Baby Food..... 844
Dr. George W. Hawley's Fracture Table..... 873
Medicinal Whisky Ruling Issued by Federal Drug Officials..... 861
Recommendations of the Committee Appointed by the Mayor of Boston to Survey the Health Department—March 24, 1934..... 871

NOTICES..... 877
OBITUARY..... 876
RECENT DEATHS..... 876
REPORT AND NOTICES OF MEETINGS..... 877, 882
SOCIETY MEETINGS, CONGRESSES AND CONFERENCES..... 879

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Worcester, at the Hotel Bancroft, Monday, Tuesday and Wednesday, June 4-5-6, 1934.

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 6, 1933

PRESIDENT: WILLIAM H. ROBEY, Boston.
VICE-PRESIDENT: PHILEMON E. TRUESDALE, Fall River.
SECRETARY: WALTER L. BURRAGE, Brookline.
TREASURER: CHARLES S. BUTLER, Boston.

STANDING COMMITTEES FOR 1933-1934

COMMITTEE OF ARRANGEMENTS
G. P. Reynolds, *Chairman;* W. M. Shedden, W. R. Morrison, Horatio Rogers, W. S. Burrage.

COMMITTEE ON PUBLICATIONS
R. I. Lee, *Chairman;* Homer Gage, R. B. Osgood, R. M. Smith, F. H. Lahey.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, *Chairman;* Gilman Osgood, G. C. Caner, J. E. Fish, H. F. Newton.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, *Chairman;* W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
Reginald Fitz, *Chairman;* C. H. Lawrence, C. A. Sparrow, E. S. Calderwood, A. S Begg.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
W. H. Robey, *Chairman;* T. J. O'Brien, F. E. Jones, A. W. Marsh, Shields Warren.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, *Chairman;* E. F. Cody, F. G. Curtis, Gerald Hoeffeli, G. D. Henderson.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, *Chairman;* E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

COMMITTEE ON PERMANENT HOME: T. J. O'Brien, *Chairman;* S. B. Woodward, C. G. Mixter, J. M. Birnie, R. B. Greenough.

OFFICERS OF THE SECTIONS FOR 1934

ELECTED BY THE SECTIONS

(The street addresses may be obtained from the Annual Directory)

SECTION OF MEDICINE
Chairman, George R. Minot, Boston; *Secretary,* Herrman L. Blumgart, Boston.

SECTION OF SURGERY
Chairman, Ernest M. Daland, Boston; *Secretary,* Joseph H. Shortell, Boston.

SECTION OF TUBERCULOSIS
Chairman, Roy Morgan, Westfield; *Secretary,* Donald S. King, Boston.

SECTION OF PEDIATRICS
Chairman, Gardner C. Cobb, Worcester; *Secretary,* James M. Baty, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, J. W. O'Connor, Worcester; *Secretary,* Thomas Almy, Fall River.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, Charles W. Blackett, Jr., Newtonville; *Secretary,* Franklin P. Lowry, Newton.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR ANNUAL MEETINGS, BETWEEN APRIL 15 AND MAY 15, 1933.

(The street addresses may be obtained from the Annual Directory)

BARNSTABLE—*President,* J. L. Chute, Osterville; *Vice-President,* P. P. Henson, Hyannis; *Secretary,* J. I. B. Vail, Hyannis; *Treasurer,* H. B. Hart, Yarmouthport; *Librarian,* E. E. Hawes, Hyannis.

BERKSHIRE—*President,* M. H. Walker, Pittsfield; *Vice-President,* W. P. Kelly, Pittsfield; *Secretary,* H. J. Downey, Pittsfield; *Treasurer,* C. T. Leslie, Pittsfield.

BRISTOL NORTH—*President,* F. V. Murphy, Attleborough; *Vice-President,* L. E. Butler, Taunton; *Secretary,* C. B. Kingsbury, Taunton; *Treasurer,* J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President,* J. H. Lindsey,* Fall River; *Vice-President,* F. M. Howes, New Bedford; *Secretary-Treasurer,* Charles Shanks, New Bedford.

ESSEX NORTH—*President,* F. H. Coffin, Haverhill; *Vice-President,* John Parr, Methuen; *Secretary-Treasurer,* E. S. Bagnall, Groveland.

ESSEX SOUTH—*President,* R. E. Foss, Peabody; *Vice-President,* J. G. Corcoran, Hamilton; *Secretary,* R. E. Stone, Beverly; *Treasurer,* Andrew Nichols III, Danvers; *Librarian,* C. M. Cobb, Lynn.

FRANKLIN—*President,* A. E. Johnson, Greenfield; *Vice-President,* H. B. Marble, Shelburne Falls; *Secretary-Treasurer,* Charles Moline, Sunderland.

HAMPDEN—*President,* J. Z. Naurison, Springfield; *Vice-President,* A. J. Douglas, Westfield; *Secretary-Treasurer,* H. L. Smith, Springfield.

HAMPSHIRE—*President,* J. D. Collins, Northampton; *Vice-President,* T. F. Corriden, Northampton; *Secretary-Treasurer,* F. E. O'Brien, Haydenville; *Librarian,* Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President,* E. E. Tyzzer, Wakefield; *Vice-President,* J. H. Fay, Melrose; *Secretary,* A. R. Cunningham, Winchester; *Treasurer,* Richard Dutton, Wakefield; *Librarian,* J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President,* B. H. Pillsbury, Lowell; *Vice-President,* F. R. Mahony, Lowell; *Secretary,* T. A. Stamas, Lowell; *Treasurer,* M. D. Bryant, Lowell; *Librarian,* P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President,* A. H. Blake, West Somerville; *Vice-President,* S. H. Remick, Waltham; *Secretary,* A. A. Levi, Cambridge; *Treasurer,* Edward Mellus, Newton; *Librarian,* S. C. Dalrymple, Newton Lower Falls.

NORFOLK—*President,* A. S Begg, West Roxbury; *Vice-President,* Cadis Phipps, Brookline; *Secretary,* F. S. Cruickshank, Brookline; *Treasurer,* G. W. Kaan, Sharon.

NORFOLK SOUTH—*President,* F. A. Bartlett, Quincy; *Vice-President,* T. B. Alexander, Scituate; *Secretary-Treasurer-Librarian,* N. R. Pillsbury, South Braintree.

PLYMOUTH—*President,* D. B. Tuholski, Brockton; *Vice-President* L. A. Alley, Lakeville, *Secretary,* G. A. Moore, Brockton; *Treasurer,* A. C. Smith, Brockton; *Librarian,* J. H. Weller, State Farm (Bridgewater).

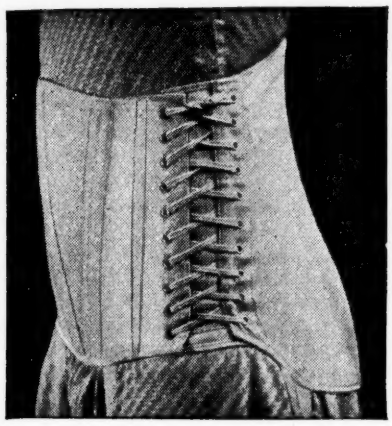
SUFFOLK—*Vice-President,* J. H. Means, Boston; *Secretary,* G. P. Reynolds, Boston; *Treasurer,* John Rock, Boston.

WORCESTER—*President,* W. C. Seelye, Worcester; *Vice-President,* E. B. Emerson, Rutland; *Secretary,* E. C. Miller, Worcester; *Treasurer,* E. P. Disbrow, Worcester; *Librarian,* A. C. Getchell, Worcester.

WORCESTER NORTH—*President,* C. E. Thompson, East Gardner; *Vice-President,* Lewis Fish,* Fitchburg; *Secretary,* F. M. McMurray, Fitchburg; *Treasurer,* F. H. Thompson, Jr., Fitchburg.

*Deceased.

Fellow members! We want your support.



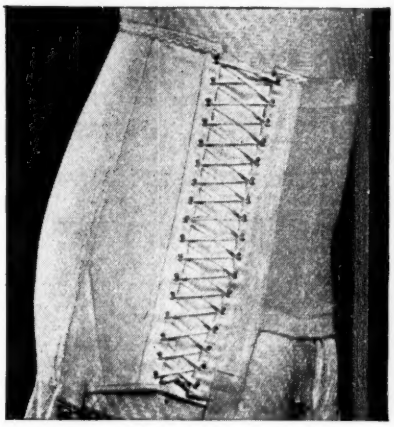
Maternity Supports

Belts and corsets for pre- and post-natal wear, designed by Pomeroy to support the figure adequately and firmly, are made without useless extra straps and buckles. They are extremely comfortable and only the best materials and workmanship are used.

Made in several designs, two of which are shown.

Left—Maternity Belt of Pink Sateen.

Right—Maternity Corset with Elastic Front.



Surgical Appliances Only Since 1867

Pomeroy Company

41 West Street, Boston, Mass.

New York
Bronx
Springfield
Detroit
Wilkes Barre
Brooklyn
Newark

Vermont State Medical Society

OFFICERS FOR 1933-1934

PRESIDENT: J. H. WOODRUFF, Barre. VICE-PRESIDENT: GEORGE G. MARSHALL, Rutland. SECRETARY: WILLIAM G. RICKER, St. Johnsbury. TREASURER: DAVID MARVIN, Essex Junction. AUDITOR: E. H. BUTTLES, Burlington.

COUNCILLORS: 1st District: Edwin A. Hyatt, St. Albans; 2nd District: John Trotter, Bennington; 3rd District: F. E. Farmer, St. Johnsbury; 4th District: John Woodruff, Barre.

PUBLICATION COMMITTEE: William G. Ricker, St. Johnsbury; Charles F. Dalton, Burlington; E. A. Stanley, Waterbury.

LEGISLATIVE COMMITTEE: John H. Blodgett, Bellows Falls; Seth Martin, Burlington; J. E. O'Brien, Rutland.

MEDICAL EDUCATION COMMITTEE: J. H. Woodruff, Barre; A. C. Black, Brattleboro; S. W. Hammond, Rutland.

EXECUTIVE COMMITTEE: Clarence H. Beecher, Burlington; William G. Ricker, St. Johnsbury; Charles Buchanan, Bennington.

NECROLOGY COMMITTEE: B. D. Adams, Burlington; G. G. Marshall, Rutland; H. L. Pierce, Swanton.

MEDICO-LEGAL COMMITTEE: F. E. Farmer (3 yrs.), St. Johnsbury; J. N. Jenne (2 yrs.), Burlington; E. A. Hyatt (1 yr.), St. Albans.

HEALTH AND PUBLIC INSTRUCTION: E. H. Buttles, Burlington; B. F. Cook, Rutland; Paul K. French, Burlington; A. B. Woodman, Springfield; Stewart Ross, Rutland.

OFFICERS OF THE HOUSE OF DELEGATES

President: C. G. Abell, Enosburg Falls; 1st Vice-President, B. D. Adams, Burlington; 2nd Vice-President: W. W. Angell, Randolph; Secretary: E. J. Quinn, Castleton.

MEMBERS OF NEW ENGLAND MEDICAL COUNCIL

John H. Woodruff, Barre; George G. Marshall, Rutland; William G. Ricker, St. Johnsbury; John A. Stevenson, Chester; Edwin A. Hyatt, St. Albans.

DELEGATES TO STATE SOCIETIES

MAINE MEDICAL ASSOCIATION: A. C. Walker, Springfield.
NEW HAMPSHIRE MEDICAL SOCIETY: John A. Stevenson, Chester.
MASSACHUSETTS MEDICAL SOCIETY: George R. Anderson, Brattleboro.
AMERICAN MEDICAL ASSOCIATION: William G. Ricker, St. Johnsbury.
CONNECTICUT STATE MEDICAL SOCIETY: J. D. Lane, Bennington.
RHODE ISLAND MEDICAL SOCIETY: A. M. Cram, Bridgewater.
MEDICAL SOCIETY OF THE STATE OF NEW YORK: A. B. Soule, Burlington.
AMERICAN MEDICAL ASSOCIATION (Alternate): Paul K. French, Burlington.
ANNIVERSARY CHAIRMAN: C. H. Beecher, Burlington.

New Hampshire Medical Society

OFFICERS FOR 1933-1934

PRESIDENT: ROBERT J. GRAVES, Concord. VICE-PRESIDENT: FREDERIC P. LORD, Hanover. SECRETARY-TREASURER PRO TEM.: C. R. METCALF, Concord.

COUNCILLORS: A. A. Pratte, Cheshire County; Emery M. Fitch, Sullivan County; Henry H. Amsden, Merrimack County; Clarence O. Coburn, Hillsborough County; Abram W. Mitchell, Rockingham County; John A. Hunter, Strafford County; Richard E. Wilder, Coos County; Charles E. Smith, Carroll County; Clifton S. Abbott, Belknap County; Arthur T. Downing, Grafton County.

TRUSTEES: Alpha H. Harriman, 1934; Thomas W. Luce, 1935; Henry O. Smith, 1936.

HOUSE OF DELEGATES: Speaker, Carleton R. Metcalf; Vice-Speaker, Henry C. Sanders, Jr.

NEW ENGLAND MEDICAL COUNCIL: Robert J. Graves, President; D. E. Sullivan,* Secretary-Treasurer; David W. Parker, term expires 1933; Frederic P. Lord, term expires 1934; Thomas W. Luce, term expires 1935.

STANDING COMMITTEES

SCIENTIFIC WORK: D. E. Sullivan,* Richard W. Robinson, Frederick P. Scribner.

PUBLIC RELATIONS, PUBLIC POLICY AND LEGISLATION: Samuel T. Ladd, Charles Duncan, Harry O. Chesley, the President, the Secretary-Treasurer.

PUBLICATIONS: D. E. Sullivan,* Benjamin P. Burpee, Lawrence Hazzard.

TUBERCULOSIS: Robert B. Kerr, R. W. Deming, A. L. Wallace.

MENTAL AND SOCIAL HYGIENE: Charles A. Weaver, Benjamin W. Baker, Charles H. Dolloff.

CONTROL OF CANCER: George C. Wilkins, Howard N. Kingsford, George F. Dwinell.

LAY HEALTH ORGANIZATIONS: Eugene B. Eastman, Robert B. Kerr, E. A. Jones, Emery M. Fitch, Carleton R. Metcalf.

DELEGATE A. M. A.: D. E. Sullivan,* 1932-1933.
ALTERNATE DELEGATE A. M. A.: Deering G. Smith, 1932-1933.
NECROLOGIST: Clarence E. Dunbar, Manchester.

ARRANGEMENTS: Hillsborough County Medical Society.

MEDICAL EDUCATION AND HOSPITALS: Robert J. Graves, term expires 1934; John P. Bowler, term expires 1935; Deering G. Smith, term expires 1936.

ADVISORY COMMITTEE ON JURISPRUDENCE: Thomas W. Luce, Rockingham County; Robert J Graves, Merrimack County; Osmon H. Hubbard, Cheshire County; Arthur T. Downing, Grafton County; Henry C. Sanders, Jr., Sullivan County; David W. Parker, Hillsborough County; Clifton S. Abbott, Belknap County; Louis W. Flanders, Strafford County; William H. Leith, Coos County; Fred E. Clow, Carroll County; D. E. Sullivan,* Concord, Chairman.

AMENDMENTS TO CONSTITUTION AND BY-LAWS: Henry O. Smith, Fred E. Clow, Thomas W. Luce.

DELEGATE TO BUREAU OF HEALTH AND PUBLIC INSTRUCTION, A. M. A.: Howard N. Kingsford.

DELEGATE TO COUNCIL ON MEDICAL EDUCATION AND HOSPITALS, A. M. A.: Ralph E. Miller.

*Deceased.

The next Annual Meeting will be held at Manchester, May 15 and 16, 1934.

Help us to make the Journal excel as an advertising medium.

NEW ENGLAND JOURNAL OF MEDICINE

Successor to the Boston Medical and Surgical Journal

The Oldest Medical Weekly in America

(Established 1828)

8 THE FENWAY, BOSTON, MASSACHUSETTS

Subscription Price, $6.00 per annum.
Canadian Postage $1.04; Foreign Postage $2.52 per annum.
Circulation January, 1932—6580.

Owned and Published by the
MASSACHUSETTS MEDICAL SOCIETY
Issued Weekly on Thursdays

ADVERTISING RATES

I. GENERAL ADVERTISING:

Two Column Page Rates:	52 Times	26 Times	12 Times	6 Times	3 Times	1 Time
One page	$1,352.00	$780.00	$408.00	$228.00	$126.00	
Per insertion	26.00	30.00	34.00	38.00	42.00	$50.00
One-half page	780.00	442.00	228.00	126.00	69.00	
Per insertion	15.00	17.00	19.00	21.00	23.00	27.00
One-quarter page	442.00	247.00	126.00	69.00	37.50	
Per insertion	8.50	9.50	10.50	11.50	12.50	14.50
One-eighth page	247.00	136.50	69.00	37.50	20.25	
Per insertion	4.75	5.25	5.75	6.25	6.75	7.75
Three Column Page Rates:						
Four inches	$208.00	$130.00	$ 72.00	$ 42.00	$ 24.00	
Per insertion	4.00	5.00	6.00	7.00	8.00	$10.00
Three inches	169.00	104.00	57.00	33.00	18.75	
Per insertion	3.25	4.00	4.75	5.50	6.25	7.75
Two inches	130.00	78.00	42.00	24.00	13.50	
Per insertion	2.50	3.00	3.50	4.00	4.50	5.50
One inch	78.00	45.50	24.00	13.50	7.50	
Per insertion	1.50	1.75	2.00	2.25	2.50	3.00

II. PREFERRED SPACE: First Cover—add 100% to above two column page rates; Fourth Cover—add 100%; Facing First Text Page—add 50%; Facing Last Text Page—add 33 1/3%; Page iii—add 33 1/3%; Special Position on any other advertising page—add 10%.
Cash Discount, 5% 10 days.

III. PHYSICIANS' CARDS*: ¾-inch space: 75c per three-line insertion; $30.00 per year.

IV. CLASSIFIED ADVERTISING (Page vi) at the following rates*: 1st insertion, 20c per 6-point line†; 2d, 3d and 4th insertions, 15c per line for each insertion; 10c per line for each insertion thereafter. If replies are to be forwarded through this office, send 15c additional. **Minimum charge for classified advertisements is 60c.**

V. The right is reserved to reject any application for space.

VI. MECHANICAL REQUIREMENTS: Width of page, 7 ins. Depth of page 9 ins. Page space, 7 x 9 ins. Half page, 7 x 4⅝ ins. or 3⅝ x 9 ins. Quarter page, 3⅝ x 4⅝ ins. or 2⅛ x 7 ins. Eighth page, 2⅛ x 3⅝ ins. Half-tones 100 screen.

Closing date one week in advance of date of publication.

VII. Advertisements may be inserted weekly, every other week, or every fourth week. Special insertion schedules arranged on request.

WALTER P. BOWERS, M.D., Managing Editor.

*Not subject to discount.
†Approximately 5 words to a line.

The New England
Journal of Medicine

VOLUME 210 APRIL 19, 1934 NUMBER 16

NEW ENGLAND SURGICAL SOCIETY

CANCER OF THE BREAST: END-RESULTS*

Massachusetts General Hospital 1921, 1922, and 1923

BY ROBERT B. GREENOUGH, M.D.,† AND GRANTLEY W. TAYLOR, M.D.†

HEREWITH is presented the fourth of a series of reports on the end-results of treatment of cases of cancer of the breast at the Massachusetts General Hospital covering all cases which entered the Hospital in the calendar years 1921, 1922 and 1923.

The first report of the series[1] was published in 1907, and covered the years 1894 to 1904. In this first report a three-year minimum period was employed, as was customary at that time (although the average period of observation after operation was nearly seven years), and untraced cases were omitted from consideration.

In 1921 another report (Number two) was published[2] recording the results in the series of cases which entered the hospital in the period from August, 1911 to April, 1914. In this series the five-year minimum period was adopted for end-results. At this time also a formula was devised for recording end-results in cancer cases which was designed to give a complete and balanced account of all cases entering the hospital in a given period, in order that the figures obtained in one hospital might more fairly be compared with those of another institution. This report covered a period during which, by special assignment, almost all cases of breast cancer were allotted to the care of the surgeons who presented the report.

In 1926, a third report was published[3] giving the results in the cases of carcinoma of the breast for the years 1918, 1919 and 1920. In this series again a five-year minimum end-result period was employed, but untraced cases were omitted from consideration. In this report the employment of prophylactic x-ray treatment as an adjunct to surgery was discussed, and the significance of the histological grading of breast cancer was presented.

The current report (Number four) covers all of the cases of breast cancer which were admitted to the Massachusetts General Hospital in the calendar years 1921, 1922 and 1923, two hundred and thirty-eight in number. Twenty-three of these cases were in the private ward and from the attending surgeons, data sufficient for classification and end-results were not obtainable. Nine were reëntries (duplicates) and two cases, although entered as cancer, were proved by pathological examination not to be cancer at all. One case received no treatment and six died of causes other than cancer before the lapse of the five-year period[4]. These cases have been deducted from the 238, leaving 197 cases for study, of which 177 were primary cases and 20 recurrent after previous operation.

In the following tables and discussion, the term "Cure" applies to a case which had pathologically proved cancer of the breast, and which has shown no evidence of a recurrence for a minimum period of five years after operation. Cases which died within the five-year period without evidence of recurrent disease are omitted as inconclusive. Cases which died after five years without evidence of disease are included as "cures". Cases which died after five years with recurrent disease are classified as failures.

The classification of cases adopted by the American College of Surgeons has certain definite advantages for recording the degree of development of the disease, and the 197 cases of this series have been tabulated in that form.

The No. 1 indicates primary cases; No. 2 indicates recurrence after radical operation, and No. 3 indicates recurrence after incomplete operation. The letters indicate the extent of disease, as follows:

A. Process confined to the breast, axillary nodes not involved.
B. Axillary nodes doubtful.
C. Axillary nodes involved.
D. Supraclavicular nodes involved.
E. Remote metastases.
F. Other breast involved.

This tabulation shows five-year "cures" in 29 per cent of all cases entering the hospital. It includes primary and recurrent cases, those treated by operation, whether radical or palliative; and those not operated on at all; a salvage of nearly one in three of all cases. One hundred and seventy-seven primary cases, including advanced and inoperable cases, gave

*Read before the New England Surgical Society, September 29, 1933, at Boston.

†Greenough, Robert B. — Consulting Surgeon, Massachusetts General Hospital and Collis P. Huntington Memorial Hospital, Boston, Massachusetts. Taylor, Grantley W. — Assistant Surgeon to Out-Patients, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue," page 871.

TABLE I

		1894-1904	1911-1914	1918-1920	1921-1923
A.	Total Entries	613	115	175	238
B.	Omit reëntries (duplicates)	80	8	7	9
B. i	Omit not carcinoma			2	2
C.	Omit recur. from previous op.	65	4	15	20
C. i	Omit private ward cases (no data)			17	23
C. ii	No treatment				1
D.	Cases available for study of operability, mortality	468	103	134	183
E.	Radical operations	360	74	100	148
F.	Incomplete operations	56	20	24	20
G.	No operation	52	9	10	15
H.	Operative deaths	15	0	4	5
I.	Operative mortality	3.6%	0	3%	3%
J.	Operability—rad. ops.	77%	72%	75%	80%
K.	Operability—all ops.	89%	91%	91%	91%
M.	Omit untraced	38	5	23	0
N.	Omit died within 5 yrs. without recurrence	2	3	4	6
O.	Primary cases for end-result data	428	95	107	177
P.	Radical operations	320	69	76	145
Q.	Incomplete operations	56	17	21	17
R.	No operation	52	9	10	15
S.	No. cases—alive and well	64	22	21	50
T.	No. cases died without recur. (over 5 yrs.)	7	1	0	6
U.	No. 5 yr. "cures"—all ops.	71 (3 yrs.)	23	21	56
V.	No. 5 yr. "cures"—rad. ops.	67 (3 yrs.)	22	21	52
W.	% 5 yr. "cures"—all ops.	19%	27%	21%	35%
X.	% 5 yr. "cures"—rad. ops.	21%	32%	27%	36%
X. i	% 5 yr. "cures"—rad. ops. IABC Group			30%	36%
Y.	% 5 yr. "cures"—glds. not inv.		56%	54%	62%
Y. i	% 5 yr. "cures"—glds. involved		24%	23%	21%
Z.	% cases remaining free from local recurrence after radical operation	1894-1904 52%	1911-1914 69%	1918-1920 58%	1921-1923 78%

32 per cent five-year successes, and primary cases of the so-called operable class (no disease evident beyond the axilla) gave 34 per cent cures. In the early favorable cases (axillary glands not found to be diseased on pathological examination) the five-year "cures" are 62 per cent.

TABLE II

	Cases	Cures	Per Cent
1 A Group—Axilla not involved	50	31	62
1 B Group—Axilla doubtful	2	2	
1 C Group—Axillary nodes involved	111	23	21
1 A B C Group—Operable Cases	163	56	34
1 D Group—Supraclavicular Nodes involved	6	0	
1 E Group—Remote metastasis	7	0	
1 F Group—Other breast involved	1	0	
1 D E F Group—Inoperable Cases	14	0	
Total Primary Cases	177	56	32
2. Recurrent after Radical Operation	11	0	
3. Recurrent after Palliative Operation	9	0	
Total All Entries	197	56	29

There were one hundred and forty-five radical operations in this series, by which is understood the removal of the whole breast, the skin over the breast, both pectoral muscles, the axillary contents to the clavicle, and the deep fascia from sternum to latissimus and from clavicle to epigastrium. These radical operations yielded fifty-two or 36 per cent five-year "cures".

The clinical criterion of operability has been a tumor movable on the chest wall with at most small movable axillary metastases. We have gradually narrowed the field of operability in the course of the years covered by these reports. Skin nodules, large or fixed axillary nodes, a swollen arm, and supraclavicular fullness have been recognized as contraindications to operation. Routine preoperative x-ray study of the bones and chest for determination of the presence of remote metastases was not followed in all cases of this series although it has since then come into general use. Care in history and examination of the patient, and clinical alertness in interpreting backache or dyspnea have gradually become more common.

The so-called "inflammatory" type of carcinoma of the breast is now generally recognized as not curable by operation. The development of effective palliative treatment in the form of radiation has made us less willing to recommend operation in poor risk patients. These factors alone even without consideration of such improvements in operative technique as we believe developed prior to this period, should entitle us to show progressive improvement in our cures by operation in successive series of cases. It is probable that with greater attention to these factors, many of the deaths which occur within the first six months after operation could be avoided.

The figures for the percentage of five-year "cures" from radical operation in operable cases (1A—1B—1C—A. C. S. Classification)

for the previous series are presented for comparison.

TABLE III

1904 (3 yrs.)	1914 (5 yrs.)	1920 (5 yrs.)	1923 (5 yrs.)
16%	32%	30%	36%

It is of interest to note that during the three-year periods ending in 1914 and 1923, Breast Cancer was a special assignment, while in the 1904 and 1920 series, cases were distributed over the regular surgical services.

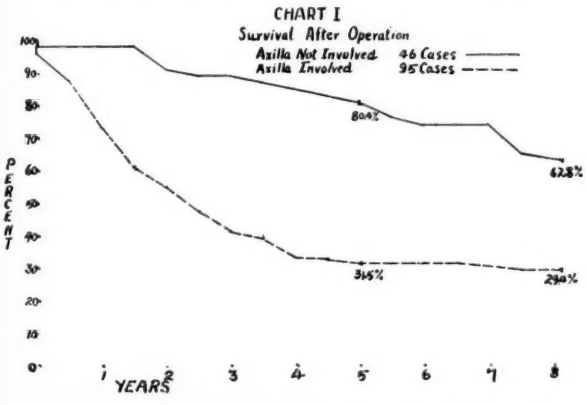
There were seventeen incomplete or palliative operations in this series with four five-year "cures" or 23 per cent. In fifteen cases no operation was attempted and the patients were given x-ray treatment. None of these patients survived five years. While the fact is already well established it is to be emphasized that nothing short of the complete radical operation can be expected to give the patient the chance to which she is entitled to be cured of cancer of the breast.

The classical measurement of the degree of extension of cancer of the breast is the involvement of the axillary lymph nodes as shown by pathological examination of the tissue. The clinical estimate of axillary involvement is, however, erroneous in a considerable proportion of cases. Thus in this series 16 out of 50 in the 1-A group were thought on clinical examination to have involved axillary nodes, which were proved on pathological examination to be free from disease (32%). On the other hand 24 out of 111 (22%) showed no clinical evidence of enlarged nodes, although on pathological examination after removal, cancer proved to be present.

It is true also that cancer in certain regions of the breast, notably the median hemisphere and the upper inner quadrant, may extend to the internal mammary chain of nodes within the chest, or directly to the supraclavicular nodes, before reaching those in the axilla. In spite of these inaccuracies, however, the involvement of axillary nodes is still our most valuable measure of the extent of the disease.

In this series there were 50 cases in the 1 A group (axillary nodes not involved) with 31, or 62 per cent five-year cures. There were 111 cases in the 1 C group (axillary nodes involved) with 23, or 21 per cent, five-year cures. The six cases in which the supraclavicular nodes were enlarged gave no cures (in spite of one attempt to dissect the supraclavicular region), and the cases of remote metastases, and the one case of bilateral involvement were also failures. The postoperative survival of the 1 A and 1 C cases is shown in chart I.

We have some reason to doubt the accuracy of clinical data as regards the duration of cancer of the breast. In the present series of cases preoperative duration of over two years was arbitrarily reduced to two years. On this basis, the average preoperative duration for 107 cases treated by radical operation was found to be 8.2 months. Of this number 78 were failures, with an average preoperative duration of 9.1 months. There were 29 five-year cures with an average preoperative duration of 5.7 months. Among the cured cases, however, there were at least three patients who reported a preoperative duration of two years or more. In a previous series (1918-1919-1920) it was found that in 39 cases with greater than the average duration there were 10 cures (26%), while in 52 cases with less than the average duration there were 12 cures (23%). In the present series the average preoperative duration in the



1 A cases (nodes not involved) was 7.2 months. The cures in this group averaged 6.2 months' duration, and the failures 8.7 months' duration. The average preoperative duration in the 1 C group (axillary nodes involved) was 8.7 months. The cures in this group averaged 5.7 months, and the failures 9.3 months. In view of these figures we must admit that however important the duration of the tumor may be in the individual case, its value in group prognosis is limited.

It is frequently suggested that cancer of the breast has a much graver prognosis in young women than in older women. When our cases are divided into two groups, those over 50 years of age, and those less than 50 (the approximate mean age of the group) it is found that the cures are respectively 34.5 per cent and 32.8 per cent. In a series as small as this one, the difference is not significant. When the cases are divided into three groups, however, those under 45 years of age, those from 45-60 inclusive, and those over 60, the percentage cures are respectively 22.2 per cent, 40 per cent and 45 per cent. About half the cases fall into the middle group, and roughly a quarter each into the young and old groups. These figures therefore do emphasize strikingly the relatively greater gravity of the disease in younger women.

The pathological classification of breast can-

cer as to the degree of malignancy as indicated by the cellular architecture and histology has been followed out in this series of cases. The criteria on which the grading was done have been described elsewhere[5]. Since the original report we have been obliged to give consideration to an additional factor, "infiltration". This is a condition found occasionally even in cases of relatively pure adenocarcinoma or medullary growth, in which the tumor cells in one place or another have broken out from their elsewhere typical conformation and have infiltrated the fat and fibrous tissue in the neighborhood in columns of a more scirrhous type. This appearance we regard as a marked step in de-differentiation, and thus an indication of high malignancy. The present series yielded 122 cases of radical operations with known five-year results, of which the microscopic slides were obtainable for review. The examination of these slides was made by Dr. H. F. Hartwell and Dr. R. B. Greenough. The grading was done without knowledge of the end-results, and in only five cases were there serious differences of opinion between the two observers; and these were readily composed on further study and discussion.

The results are shown in table IV, which presents also the percentages of cures from the previous series for comparison.

TABLE IV

DEGREE OF MALIGNANCY IN RELATION TO CURES

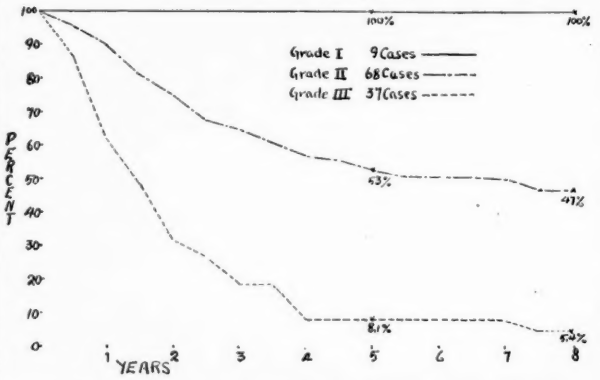
	Cases	Cures	Per Cent	'18, '19, '20 Series Per Cent
Axilla Not Involved				
Grade I	8	8	100	82
Grade II	29	17	59	43
Grade III	5	0	0	0
Axilla Involved				
Grade I	1	1	100	50
Grade II	42	13	31	31
Grade III	37	1	3	0

The grade of malignancy in relation to the duration of postoperative life is shown in chart II.

In this series the number of low-grade tumors is lower than in the previous series. The percentages, however, are not materially different. One notable exception exists to the general rule, namely, the single case in the Grade III, I C group which is alive and well, now nine years after operation. This case has been reviewed and discussed, but shows so great a degree of pleomorphism and so complete a degree of de-differentiation that it is impossible to grade it other than as a highly malignant tumor.

The application of this classification of the degree of malignancy of a breast cancer to the prognosis of the individual case must be made with considerable reservation. We must recognize that every case of breast cancer is capable of causing the death of the patient. Again the extent of the disease is of the greatest significance. Other things being equal, however, we may say that a tumor of low-grade malignancy does not extend so widely nor so promptly from the point of origin, and thus the opportunity for successful removal is greater than in the middle group, and far, far greater than in tumors of high malignancy. That 42 out of 122, or 34 per cent of this series fell in the high-grade group indicates that a very considerable number of cases of cancer of the breast are still beyond the hope of surgical relief. However, unless our present idea of the origin of cancer as a local process is incorrect, there

CHART II
Survival After Operation



is no reason why earlier and earlier recognition of the disease should not give us more and more cures even in the cases of high-grade malignancy.

The significance of the grading for prognosis may be considered also from the viewpoint of preoperative duration of the disease. It will be noted that all the Grade I cases were cured and that with one exception all the Grade III cases were failures. The average preoperative duration for both groups was the same, namely eight months. The Grade II cases without axillary involvement presented an average duration of 5.3 months in the cured cases, and of eight months in the failures. The Grade II cases with axillary involvement averaged 4.6 months in the cured cases and 10.3 months in the failures.

Axillary metastases were present at the time of operation in 11 per cent of Grade I cases, 70 per cent of Grade II cases, and 90 per cent of Grade III cases.

An attempt was made to determine the possible danger of exploratory incision in cases of doubtful diagnosis. Definite exploration of the tumor was made in 27 cases, including a few in which several days elapsed between simple mastectomy and radical operation. This group presented 15 cures (55.5%). It should be realized that cases in which exploration is indicated are

in general very early cancers, and that the curability is high in this group. Certainly the figures give no ground for supposing that exploration is prejudicial to cure. We are strongly of the belief, however, that exploration or excision of a doubtful breast tumor should never be undertaken unless facilities for a frozen section diagnosis, and for the completion of the radical operation at the same sitting, are available.

In addition to radical operation, 125 cases received either preoperative or postoperative prophylactic x-ray therapy. These cases gave 48 or 38 per cent five-year cures. The 13 cases which did not have x-ray therapy yielded only four, or 31 per cent cures. The relatively small number of cases in the latter group makes this percentage difference of little or no significance.

Only 11 cases received preoperative x-ray therapy, with nine failures and two successes. Seven of these cases also received postoperative x-ray therapy.

Virtually all the x-ray cases were treated either by Dr. G. W. Holmes at the Massachusetts General Hospital, or by Dr. L. B. Morrison of Boston. During this period Dr. Holmes was using a Waite and Bartlett machine, 5 milliamperes, 16 inch distance, 3 mm. aluminum filter, 80 K.V., later equipped with boosters to yield 200 K.V. Dr. Morrison used an Acme machine, 140 K.V., 12 inch distance. For preoperative treatment 1 erythema dose was given. For postoperative treatment usually two erythema doses were given in one series of 12 to 14 weeks.

It is regrettable that opportunity for comparison of similar series with and without prophylactic radiation is not available at this time. With the data available, however, we are forced to admit that prophylactic x-ray treatment gave slightly better five-year results in this series than in the previous series, and that the improvement in the end-results of this series may well be due in part at least to the more general use of x-ray. It should be noted, however, that in the 1918-1919-1920 series the I A cases (glands not involved) formed only 25 per cent of the whole series, while in the present group the percentage of I A cases has risen to 28. Final conclusions in regard to the value of prophylactic x-ray, therefore, are scarcely justified from these statistics.

SUMMARY AND CONCLUSIONS

1. A consecutive series of cases of cancer of the breast entering the Massachusetts General Hospital in the years 1921-1922-1923 is reported with the five-year end-results.

2. In comparison with previous series, the percentage of five-year cures has gradually increased since 1904. Greater care in estimation of the operability may be expected to increase the percentage of five-year cures.

3. Twenty-nine per cent of all cases entering the hospital are free from disease more than five years, and 36 per cent of the cases of radical operation are free from disease more than five years.

4. The extent of the disease as determined by pathological examination of the tissues removed at operation is of the greatest importance in prognosis.

5. The preoperative duration of the tumor as recorded by the patient is of relatively little value in prognosis.

6. Cancer of the breast in young women is less curable than cancer in older women.

7. The histological grading of the degree of malignancy of the tumor is of great importance in prognosis, but it must be considered in connection with the extent of the disease and with other factors affecting the prognosis.

8. Tumors pathologically of high-grade malignancy metastasize early to the axillary lymph nodes and elsewhere.

9. Exploratory incision or excision of a breast tumor, properly performed, does not prejudice the chance of cure.

10. Prophylactic x-ray therapy was employed almost as a routine in this series, and the improved results in the series may be in part due to this treatment.

11. Further reduction of the mortality from cancer of the breast depends today chiefly upon further education of the public and of the profession to regard seriously and to treat promptly and properly any abnormality of the breast.

NOTE: The writers acknowledge gratefully the assistance of Dr. Charles E. Dumas of Boston in reviewing the radiation therapy given in these cases, and of Dr. Harry F. Hartwell in the study and grading of the pathological material.

REFERENCES

1 Greenough, R. B.; Simmons, C. C., and Barney, J. D.: The results of operations for cancer of the breast at the Massachusetts General Hospital from 1894 to 1904. Surg. Gynec. & Obst. 5: 39 (July) 1907.

2 Greenough, R. B., and Simmons, C. C.: End-results in cancer cases. Cancer of the breast. Boston M. & S. J. 185: 253 (Sept.) 1921.

3 Greenough, R. B.: Carcinoma of the breast. Results of treatment 1918-1919-1920. Am. J. Roentgenol. 16: 439 (Nov.) 1926.

4 No. 2, age 66. Died strangulated hernia, 21 mos.
No. 31, age 76. Died heart disease (autopsy), 55 mos.
No. 68, age 75. Died cerebral hemorrhage, 26 mos.
No. 118, age 74. Died myocarditis, 14 mos.
No. 162, age 87. Died cardiorenal, 44 mos.
No. 177, age 47. Died carcinoma stomach, 14 mos.

5 Greenough, R. B.: Varying degrees of malignancy of cancer of the breast. J. Cancer Research. 9: 453 (Dec.) 1925.

CANCER OF THE BREAST: END-RESULTS*

Massachusetts General Hospital 1924, 1925, and 1926

BY CHANNING C. SIMMONS, M.D.,† GRANTLEY W. TAYLOR, M.D.,† AND RICHARD H. WALLACE, M.D.†

THE following report is based on the cases of carcinoma of the breast admitted to the Massachusetts General Hospital in both the private pavilion and the general wards for the three-year period, 1924-1925-1926. It is made for comparison with similar reports prepared by Dr. Simmons and Dr. Greenough.

In 1907, the cases of cancer of the breast admitted to the hospital from 1894 to 1904, 613 in number, were collected and the results of treatment studied on a three-year basis[1].

In 1921, the results of treatment of 115 cases observed in the three-year period 1911 to 1914 were reported on a five-year basis[2].

In 1926, the results of treatment of the cases seen in the hospital in the three-year period 1918-1920 were studied. In this series the cases treated in the private pavilion were included[3].

The results of treatment of the cases seen in the three-year period 1921-1923 have been collected by Dr. Greenough[4].

TABLE 1

EXTENT OF DISEASE—OPERABLE CASES

	No. of Cases	Axillary Glands Not Involved
1894-1904	353	33%
1911-1913	62	31
1918-1920	99	30
1921-1923	148	28
1924-1926	168	41

This series has been studied to determine if there has been any improvement in the results of treatment. During the period 1910 to 1920 the radical operation was more generally performed, and in this series the patient had the advantage of x-ray treatment combined with surgery, although radiation treatment at this time was admittedly much inferior to that given at the present day. An active campaign of public education was also instituted by the American Society for the Control of Cancer and the Massachusetts Department of Public Health in 1924.

In all of the earlier series the ratio of cases without involvement of the axillary glands to those in which the lymph nodes were diseased remained about the same. This series shows a slightly larger proportion of early cases. (Table 1.)

*Read before the New England Surgical Society, September 29, 1933, at Boston.

†Simmons, Channing C. — Visiting Surgeon, Massachusetts General Hospital. Taylor, Grantley W. — Assistant Surgeon to Out-Patients, Massachusetts General Hospital. Wallace, Richard H. — Assistant in Surgery, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue," page 871.

Taken as a whole the figures show some improvement and suggest that patients are seeking advice for a tumor of the breast at an earlier date.

Many statistical papers on the etiology of the disease have been published and in the following only those factors which have a direct bearing on the choice of treatment and prognosis will be considered. In studying the cases the histories were posted on the abstract record sheets prepared by the American College of Surgeons and the classification adopted by the College was employed.

The term "cure" is applied to cases living without evidence of disease five or more years after operation. No case is considered as a cure unless the diagnosis was confirmed microscopically. A minimum of five years from the time of operation has elapsed in all cases. The average time after operation was seven years while many cases have been followed for nine years. Eight cases (10.5%) living at the end of five years are known to have died later of metastases and are considered as failures. It is probable that a few others now living will also die of this disease. The greater number of the living cases were examined personally by some member of the hospital staff or their local physician, although in a few instances it was necessary to rely on a letter from the patient.

Untraced cases are considered as having died of cancer. This may not seem quite fair for it has been found that, in this community at least, any case which cannot be traced is usually living. We believe, however, that if the cases are treated in this manner the figures are less open to criticism.

OPERABILITY—It is impossible to determine with any degree of accuracy the percentage of operability. The cases operated upon in the private ward were, obviously, not referred to the hospital unless operable. On the other hand, many incurable patients were hospitalized in order that they might receive high voltage x-ray treatment.

Apparent arithmetical errors may be noted in certain of the tables. We believe these have all been satisfactorily accounted for but to avoid confusion the reasons have not been given in the individual table.

During the three-year period 238 cases were admitted to the hospital. These cases may be divided as follows (table 2):

This discussion will be confined to the primary operable cases, i.e., the 1-A and 1-C groups of the classification of the American College of Surgeons.

There were 179 operations performed by 22 surgeons; 90 were performed by two men. Only two other surgeons performed more than eight operations during the three years.

RADICAL OPERATION — By radical operation is meant the removal of the breast with all the overlying skin, the deep fascia; the contents of the axilla and both pectoral muscles. A modified transverse axillary incision was usually employed and the longitudinal incision carried well down toward the umbilicus, in order to remove the lymphatics from this region. A portion of the anterior sheath of the rectus muscle was usually removed. The skin incision was beveled to remove a large amount of subcutaneous tissue. The wounds were usually closed with some tension and drained. Secondary skin grafts were rarely necessary. We have been impressed by the relatively few cases of skin recurrence when the subcutaneous lymphatics were removed, and we believe it is unnecessary to excise a very large amount of skin if the incision is made in this manner. Slight sepsis and sloughing of the edge of the skin flap occurred in many instances, but rarely necessitated closure by secondary skin graft.

TABLE 2

CASES AVAILABLE FOR STUDY

1. Primary Cases		208
(A) Disease limited to breast	76	
(C) Disease limited to breast and axilla	114	
(D-E-F) Advanced—Incurable by surgery	18	
2. Recurrence after radical operation		14
Local and axilla	3	
Remote	11	
3. Recurrence after incomplete operation		11
Local and axilla	8	
Remote	3	
4. Admitted for prophylactic x-ray—operation elsewhere		5
		238

INCOMPLETE OPERATION—This term has been employed to cover any operative procedure short of the radical operation. We consider it justifiable in certain elderly people in poor physical condition, or as a palliative procedure to remove a sloughing tumor if the local growth cannot be controlled by radiation.

The 190 primary cases in which the disease was limited to the breast or breast and axilla may be subdivided as follows (table 3):

It will be noted that of the 179 cases operated upon the end-result is known in 176. Excluding the case in which no pathological examination of the specimen was made, the cases that died of other causes within five years, without recurrence of disease, and the patients that refused operation there remain 167 cases suitable for study. The cases dying of intercurrent disease less than five years after operation have been carefully reviewed and it is improbable that death was caused by a remote metastases. In 66 or 40 per cent the axillary glands were not involved microscopically, while in 101 the disease had extended into the axilla.

TABLE 3

PRIMARY OPERABLE CASES

1—A Disease limited to the breast		
Suitable for study		64
Refused operation		3
Died without recurrence less than 5 years		6
No pathological report		1
Postoperative death (considered as failure)		1
No follow-up (considered dead of disease)		1
		76
1—C Disease limited to breast and axilla		
Suitable for study		99
Refused operation		8
Died without recurrence less than 5 years		5
No follow-up (considered dead of disease)		2
		114

RESULTS—Of the total of 167 primary cases in which the disease was confined to the breast and axilla, 69 are known to be living and free from disease five or more years after operation (40.9%). This is to be compared with the figures in previous reports. (Table 4.)

TABLE 4

COMPARISON OF RESULTS OF TREATMENT

Period	Per Cent Cures
1894-1904 (3 years)	19%
1911-1914 (5 ")	27
1918-1920 (5 ")	30
1921-1923 (5 ")	35
1924-1926 (5 ")	41

There was one postoperative death of pulmonary embolism on the 18th day.

Of the 167 cases a radical operation was performed on 158, and an incomplete operation on nine. Of the nine patients in whom an incomplete operation was performed five are living without disease; two of these were 75 years of age, and in two a small area of carcinoma was found microscopically after a simple amputation for what was believed to be cystic disease. The fifth case was one of medium malignancy in which cancer was found in the glands removed from the lower portion of the axilla. Three of

the cases that died of recurrence and two of those living received prophylactic postoperative high voltage x-ray treatment.

EXTENT OF DISEASE AND RESULTS—The operable primary cases in which an attempt to cure by surgery was made may be divided into those with and those without involvement of the axillary glands. There were 66 cases in which the disease was confined to the breast with 43 cures or 64 per cent, and 101 cases in which the axilla was involved with 26 cures or 26 per cent. (Table 5.)

TABLE 5

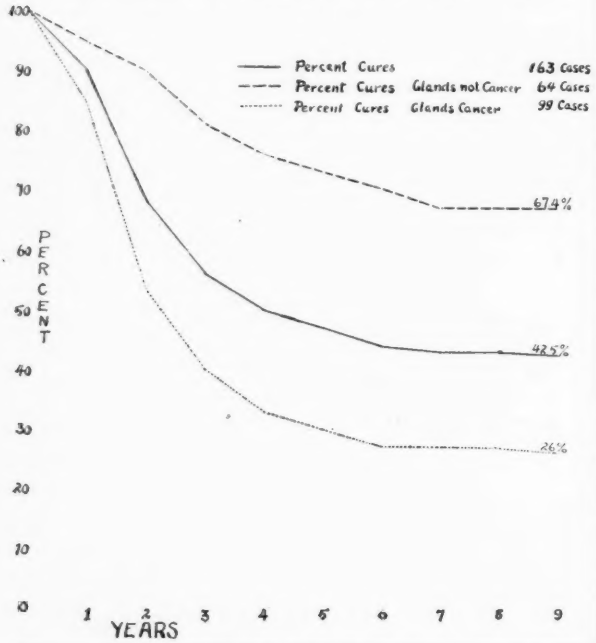
CURES AND EXTENT OF DISEASE

	Cases	Cures	Per Cent Cures
Axillary glands not malignant	66	43	64%
Axillary glands cancerous	101	26	26

The results are shown in graphic form in table 6 which gives the percentage of cases living at yearly intervals. In making these graphs the three cases in which the result is not known are omitted.

TABLE 6

PERCENTAGE OF CURES AT YEARLY INTERVALS



PATHOLOGY AND RESULTS:—In most cases the specimens were available for review and examined by Dr. H. F. Hartwell, surgical pathologist at the Massachusetts General Hospital, Dr. Greenough or Dr. Simmons.

The cases were divided into three degrees of malignancy: low, medium and high, and the results of treatment of these three groups compared. The following points were considered in determining the degree of malignancy:

(1) The degree of differentiation of the cells, that is the tendency of the tumor cells to form glands and the evidence of secretory activity, as shown by the presence of vacuoles in the protoplasm.
(2) The uniformity in size and general appearance of the cells and nucleus, and the number of mitotic figures.
(3) The tendency of the tumor to infiltrate.

A tumor composed of cells of uniform size and shape, containing vacuoles and having a marked adenomatous arrangement was considered as being of low malignancy. One in which there was little or no tendency to glandular formation and in which the cells infiltrated the surrounding tissues, varied in size, and presented pleomorphic nuclei with many mitotic figures was considered as being of high malignancy. Comparing the pathological index of malignancy as determined in this manner with the results, it was found that there was a very distinct relation between the two. (Table 7.)

TABLE 7

PATHOLOGICAL INDEX OF MALIGNANCY AND CURES

	Cases	Cures	Per Cent Cures
Grade 1	27	22	80%
2	89	34	39
3	47	13	27.7

Taking into consideration both the pathological index of malignancy and the extent of the disease the results were as follows (tables 8 and 9):

TABLE 8

PATHOLOGICAL INDEX OF MALIGNANCY AND CURES

Axilla Not Involved

	Cases	Cures	Per Cent Cures
Grade 1	20	18	90%
2	26	19	58
3	8	4	50

TABLE 9

PATHOLOGICAL INDEX OF MALIGNANCY AND CURES

Axillary Involvement

	Cases	Cures	Per Cent Cures
Grade 1	7	4	57%
2	53	13	24
3	39	9	23

This is shown in graphic form in tables 10-11-12, in which the percentage of patients living at yearly intervals is given for the different grades. In tables 11 and 12 the results are given for the

groups with and without axillary involvement separately.

In cancer of low malignancy the axillary glands were involved in about one-third of the cases, in cancer of medium malignancy one-half, and if the tumor was of high malignancy two-thirds.

TABLE 10

PATHOLOGICAL INDEX OF MALIGNANCY AND PERCENTAGE OF CURES AT YEARLY INTERVALS

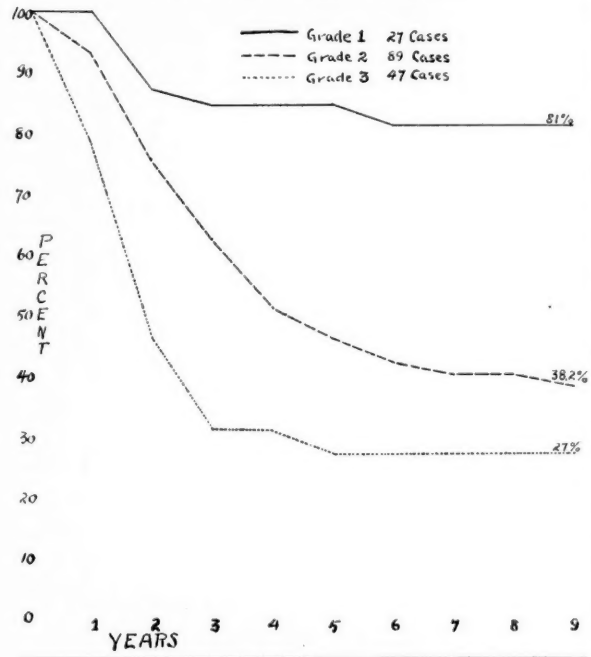


TABLE 11

PATHOLOGICAL INDEX OF MALIGNANCY AND PERCENTAGE OF CURES AT YEARLY INTERVALS—DISEASE LIMITED TO THE BREAST

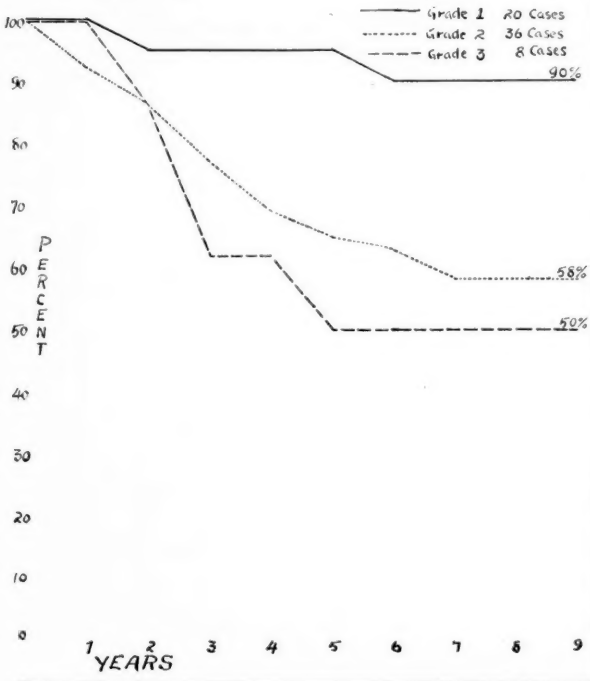


TABLE 12

PATHOLOGICAL INDEX OF MALIGNANCY AND PERCENTAGE OF CURES AT YEARLY INTERVALS—AXILLA INVOLVED

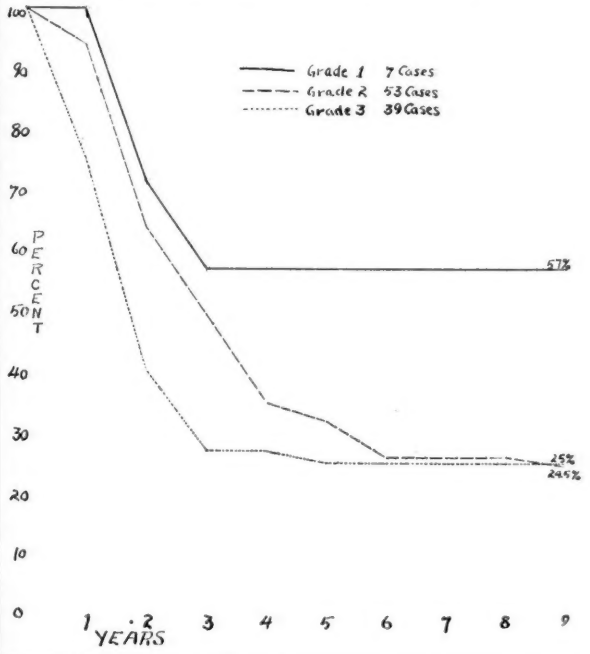


TABLE 13

PATHOLOGICAL INDEX OF MALIGNANCY AND AXILLARY INVOLVEMENT

	Axillary Glands Not Cancerous	Axillary Glands Cancerous
Grade 1	65%	35%
2	45%	55%
3	30%	70%

It will be noted that the results of operation for cancer of low malignancy with diseased axillary glands were better than those of cancer of medium malignancy in which the disease was confined to the breast.

From a study of the results of this group of cases we believe that the pathological index of malignancy is of definite aid in determining the prognosis in the individual case, although several other factors must also be taken into consideration. Certain striking exceptions that cannot yet be explained occur, and the personal equation of the pathologist also enters into the grading of any group of cases.

AGE AND RESULTS OF TREATMENT (Data on 155 cases)—The ages of the patients varied between 32 and 81, and contrary to the statement often made there were an appreciable number of cures in patients under 40 years of age. Of the 17 cases between the ages of 30 and 40, six were living without disease five or more years after oper-

ation. In all of these cases the disease was limited to the breast, however. (Table 14.)

TABLE 14

AGES AND RESULTS

Age	Cases	Cures	Per Cent Cures
31-40	17	6	34
41-50	53	21	40
51-60	50	22	44
61-70	26	11	40
71-80	9	3	33
Totals	155	63	

The cases were then divided into two groups. Of 70 cases less than 50 years of age 27 or 39.6 per cent were cured, while of 85 patients over 50 years of age 35 were cured or 40.7 per cent. These figures suggest that although the diffuse cancer seen in lactating breasts in younger women is usually incurable by surgery, other forms do occur which are not so highly malignant. These two types can often be recognized clinically. Of the six cases under 40 years of age cured, two were pathologically of low malignancy, one of medium and three of high malignancy. It will be noted in the table that the percentage of cures varied relatively little in the different decades when the small number of cases in any one bracket is considered.

Taking into consideration the pathological index of malignancy and the age of the patients operated upon, it was found that there was a slightly larger number of cases of the more malignant forms in patients between the ages of 30 and 40, but the figures were not striking. The actual percentage of cases of high malignancy occurring in this decade may be somewhat larger than is indicated by the figures, as the inoperable cases were, obviously, not referred to the private ward for operation, and if seen as out-patients in the general hospital were referred directly to the x-ray department for treatment. (Table 15.)

TABLE 15

PATHOLOGICAL INDEX OF MALIGNANCY AND AGE

Ages	No. of Cases	Grade 1	Grade 2	Grade 3
31-40	17	12%	52%	35%
41-50	53	19%	54%	26%
51-60	50	16%	48%	36%
61-70	26	19%	66%	15%
71-80	9	11%	55%	33%
Totals	155	16.8%	54.2%	29%

OPERATION AND RADIATION—RESULTS (Data on 164 Cases) — Prophylactic radiation treatment as given in the years 1924-1925-1926 would be considered inadequate when judged by present-day standards. Eight hundred r were given in 3 doses with the high voltage machine, that is 200 k.v. The exposures were made at 50 cm. distance and filtered by ½ mm. of copper and 4 mm. aluminum. Three portals were used as follows: one 20 x 20 cm. over the chest anterior, one 15 x 15 cm. in the axilla and one 15 x 15 cm. to the back to include the supraclavicular space.

In studying the cases, those that did not report regularly are excluded. Ninety patients received what at that time was considered sufficient prophylactic x-ray treatment. This was given before operation in 12 instances, and in 78 after operation. Of the 90 cases, 31 are living, 34 per cent; while of the 74 patients who received no prophylactic x-ray treatment 41 are living, or 54 per cent. To exclude the error which might be due to the possibility that only the more advanced cases received prophylactic treatment, the cases in which the axillary glands showed no disease were considered separately. Of 18 cases without axillary disease that received radiation treatment 11 were cured, 61 per cent; while of 44 cases in the same group who did not receive treatment 30 were cured or 68 per cent. In the patients in whom the glands were diseased, 70 received radiation treatment of which 18 were cured or 26.7 per cent; and, of the 28 cases that did not receive treatment in this group, seven were cured or 25 per cent. The results are shown in table 16. It will be noted that the figures in both of these groups are practically the same. It must, therefore, be concluded that prophylactic radiation treatment as given in the years 1924-1925-1926 to this group of cases did not influence the results of operation.

TABLE 16

SURGICAL CURES AND PROPHYLACTIC RADIATION

	X-Ray Given			*No X-Ray*		
	Cases	Cures	Per Cent	Cases	Cures	Per Cent
Axilla not involved	18	11	61%	44	30	68%
Axilla diseased	70	18	26.7	28	7	25

The duration of life after operation in these two groups of cases is shown graphically in tables 17 and 18.

Accurate data in regard to the effect of x-ray in preventing local recurrences and to the prolongation of life and relief of symptoms in recurrent cases are unsatisfactory, for if all the factors that govern the prognosis are taken into consideration there remain such a small number of cases in each group that it is unfair to draw conclusions. The general impression obtained, however, was that prophylactic radiation did not prevent local recurrence. In cases of recurrent cancer, radiation treatment made the patient more comfortable and prolonged life.

EXPLORATORY INCISION—In many cases the tumors were seen at an early stage of the disease and an exploratory incision was made into the growth to verify the diagnosis, before performing the radical operation. In most instances, an incision was made directly into the tumor, a specimen removed for examination and the wound packed with a sponge wet in alcohol or formalin. The radical operation was then performed immediately. Thirty-three cases were explored before operation in this manner of which 21 were cured or 65 per cent. In 127 instances the tumor was not explored, and of these cases 45 or 35.4 per cent were cured.

It is obvious that the early cases favorable for surgical cure and in which the diagnosis was in doubt were explored, while in the more advanced cases a radical operation was performed without investigation of the primary tumor. It seems fair to assume, however, from these figures that a carefully performed biopsy followed by immediate radical operation does not tend to disseminate the disease.

In two instances the tumor of the breast was excised at another institution, found to be cancer and the patient referred to the Massachusetts General Hospital where a radical operation was performed five and fourteen days later. One of these was a case of low malignancy in which the disease was confined to the breast and the operation resulted in a cure. The other was a case of high malignancy with axillary involvement and the patient died of recurrence. We have felt that a biopsy performed in this manner was a dangerous procedure as it disseminated the disease, and that the radical operation performed later rarely resulted in a cure.

DURATION OF DISEASE—GRADE OF MALIGNANCY AND RESULTS (Data on 139 Cases)—As in previous series of cases it was found that the duration of the tumor before operation had little relation to the percentage of cures. This is interpreted to mean that the cures were obtained in the slowly growing forms of the disease. Of 94 cases of less than six months' duration, 41 or 43.5 per cent were cured, while in 49 cases of over six months' duration 21 or 43 per cent were cured. If the pathological index of malignancy was considered as well, the figures are far from conclusive, but suggest that a larger proportion of the cases of high malignancy considered suitable for operation were seen within six months of the onset of the disease. It is to be inferred that the average case of high malignancy of over six months' duration was considered inoperable. (Table 19.)

TABLE 17

DURATION OF LIFE WITH AND WITHOUT PROPHYLACTIC RADIATION—DISEASE LIMITED TO THE BREAST

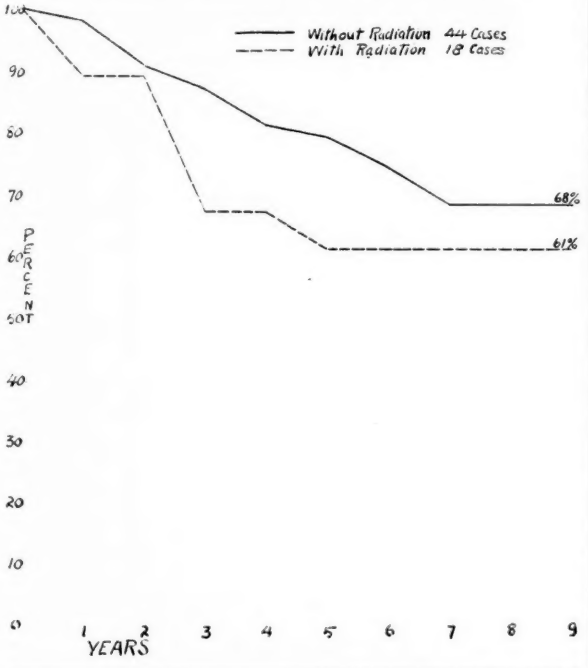


TABLE 18

DURATION OF LIFE WITH AND WITHOUT PROPHYLACTIC RADIATION—DISEASE LIMITED TO BREAST AND AXILLA

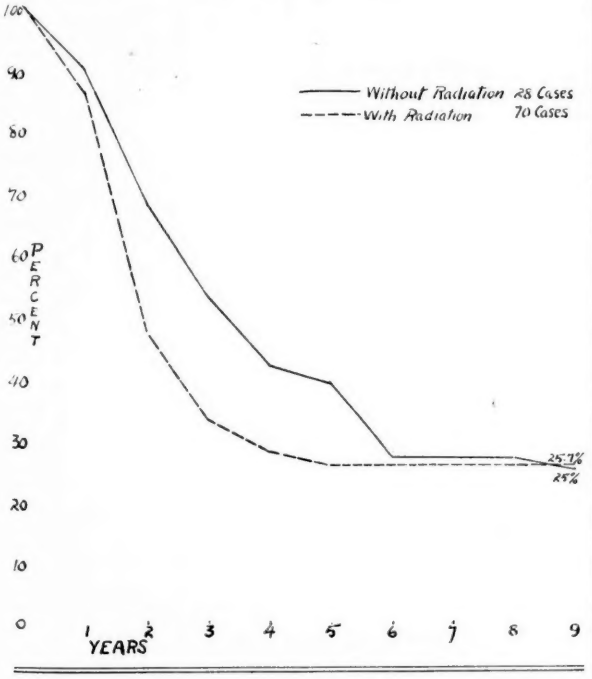


TABLE 19

DURATION OF TUMOR AND PATHOLOGY

	Less Than 6 Months	Over 6 Months
Grade 1	60%	40%
2	65	35
3	70	30

SUMMARY

(1) The five-year end-results of the cases of carcinoma of the breast operated upon

at the Massachusetts General Hospital in both the private pavilion and the general wards are given.

(2) There were 167 cases in which an attempt at surgical cure was made, and the result is known in 164 instances. Where the result is not known the case is presumed to have died of cancer.

(3) Sixty-nine cases or 40.9 per cent are living without evidence of disease from five to nine years after operation.

(4) In the 66 cases in which the disease was confined to the breast 43 or 64 per cent are living.

(5) Of the 101 cases in which the disease extended to the axillary glands 26 or 26 per cent are living.

(6) The pathological index of malignancy as determined by the amount of differentiation of the cells in the microscopic specimen was found to be one of the important factors governing the prognosis.

(7) Cancer of low malignancy curable by surgery occurs frequently in women under 40 years of age.

(8) Prophylactic x-ray treatment as given in 1924-1925-1926 to this group of cases apparently had no effect in preventing recurrence.

(9) The impression obtained from the study of recurrent cases, however, was that radiation treatment made this group of patients more comfortable and prolonged life.

(10) Exploratory incision if carefully performed does not disseminate the disease.

(11) Something over 11 per cent of the cases living without evidence of disease 5 years after operation will subsequently die of recurrence.

REFERENCES

1 Greenough, R. B.; Simmons, C. C., and Barney, J. D.: The results of operations for cancer of the breast at the Massachusetts General Hospital from 1894 to 1904. Surg. Gynec. & Obst. 5: 39 (July) 1907.

2 Greenough, R. B., and Simmons, C. C.: End-results in cancer cases. Cancer of the breast. Boston M. & S. J. 185: 253 (Sept.) 1921.

3 Greenough, R. B.: Carcinoma of the breast. Results of treatment 1918-1919-1920. Am. J. Roentgenol. 16: 439 (Nov. 1) 1926.

4 Greenough, R. B., and Taylor, Grantley W.: Cancer of the breast: End-results Massachusetts General Hospital 1921, 1922, and 1923. New Eng. J. Med. 210: 831 (April) 1934.

DISCUSSION

DR. CARL MERRILL ROBINSON, Portland, Maine*: *Mr. President and Members of the Society*—Just 48 hours before I left for Boston, I noticed by the program that I am expected to discuss the statistical papers of Dr. Greenough and Dr. Simmons. You have my apology for my inadequate and almost extemporaneous discussion.

*Read by Dr. William H. Bradford.

At the Maine General Hospital during the five years previous to last June, there were 203 breast cases admitted. A much simplified classification of them is as follows:

Abscess	12
Adenomatous growths all types	26
Mastitis and cystic disease	58
Fibroma	2
Lipoma	2
Dermoid cyst	1
Simple hypertrophy	3
Sarcoma	2
Paget's disease	1
Duct cancer	3
Metastatic cancer	3
Primary cancer	90
	203

Approximately 50 per cent of all breast cases admitted were malignant. End-results are not available as our tumor and follow-up clinics are just getting under way.

My personal records, 1926-1932, show 45 cases of cancer of the breast operated upon and a considerable number of others referred for radiation. In January of this year, I had reports from 36 of these. Twenty-three were living and symptom-free; six over five years, five over four years, and ten over two years. Three died of other causes, ten died presumably of cancer. There were six deaths within two years of operation from cancer of liver, bone metastasis or general carcinomatosis but I did not find any record of local recurrence in these cases. These few cases show very definitely the distinction between operability and curability by operation. They show our helplessness in detecting early metastasis either by x-ray or physical examination. I am assuming that metastasis had taken place before operation as I have no evidence of local recurrence as the source of general dissemination.

In going over the records of the x-ray therapy department with Dr. Thaxter, I find a distressingly large number of cases sent in for postoperative radiation with bone and lung metastases, so obvious, that they should have been easily detected by x-ray before operation. Operation on this type of case, other than as a palliative procedure, brings disrepute to surgery and helps to send curable patients to the various cults and types of quackery.

We are very sure that our end-results at the Maine General are definitely improving since we have insisted on careful x-ray study before the decision on operability is made.

I must report one tragic case in which we tried so hard to do the right thing. A life-long friend of mine and the wife of a doctor consulted me about five years ago at the age of 47 for a small nodule in the upper outer quadrant of the left breast. Her husband had known of it for two years but considered it of no importance. Both breasts were large and heavy and had always produced an overabundance of milk during her four periods of lactation. The general impression was bilateral cystic disease. No other distinct nodules were felt and no glands palpable. Removal of the growth showed it to be encapsulated and grossly benign. Frozen section report was adenoma but because of the presence of cystic disease about the tumor, pathologists advised simple mastectomy which was done. Study of the breast tissue removed showed adenocarcinoma. We had obviously done inadequate surgery for cancer of the breast.

The slides were seen by Dr. Greenough and Dr. Hartwell. We were advised to subject the patient to immediate x-ray treatment and to do a radical operation after several months. The dissection of

the axilla was done about three months after the original mastectomy and showed a single gland with evidence of invasion. The functional result was excellent. The patient resumed all her activities and gained weight.

Shortly after her first radiation, the remaining breast showed some diminution in size, and the gland tissue seemed peculiarly close to the skin. The breast, which had been removed, showed cystic disease and we assumed that a similar process was present in the remaining breast, with involution hastened possibly by radiation. However, we sent her to Dr. Greenough for consultation. Should a simple mastectomy be done? Dr. Greenough felt that it was unnecessary. Repeated examinations, physical and x-ray, showed no change in her condition.

A few months ago, she presented herself to me in the best of health but somewhat concerned because a friend of hers had told her that fixation of the skin over the breast meant cancer. The process was distinctly more definite than on previous examination and the whole breast felt firmer but no definite tumor could be felt. Again we called for help and Dr. Greenough advised surgery. Radical operation of the breast was done and a small hard cancer was found with much fibrosis of the whole breast. Pathological examination showed carcinoma of the duct type with a single gland in the axilla showing invasion. Again she had x-ray and to date is doing well. Here we have two distinct types of cancer in opposite breasts both, of which, showed cystic disease. Were both of these tumors primary?

I have enjoyed very much the papers by Dr. Greenough and Dr. Simmons. They bring to mind more clearly than ever how difficult it is to keep a proper perspective on a problem like cancer in a small hospital with relatively few cases in any one series.

Dr. Lucius C. Kingman, Providence, R. I.: These breast tumors are clinically queer. There was a patient in the office yesterday for a routine examination, on whom I did a radical breast operation seventeen years ago, and from whom I removed a skin nodule about three inches from the original scar one year ago. That nodule was adenocarcinoma. Where had the cells been in the meantime? Where have the cells been all the time that show up in the spine nine years after a radical operation?

As we see the cases clinically, about all we can do is to determine whether in that individual case we can get away with an operation. We see a case and we fear to operate on it and we think, "What's the use? She will be dead in three months," and she dies of pneumonia nine years later. Another case, on which we think we have done a beautiful job, dies of lung metastasis in three months. Until we know the underlying factors of cancer, we can't do much more than that.

In regard to radiation, I think most of us feel we have to hit the carcinoma with everything we have that may be of benefit. We, unfortunately, at home, in a tumor clinic, see a great many cases that are inoperable. These we subject to radiation and we get an occasional case in which, following radiation, we can do a palliative operation at least. Under our eyes cancer tissue is affected by radiation. If so, before operation, it seems reasonable that there must be some effect in some cases following operation.

I am quite in agreement with the first speaker who mentioned axillary involvement probably being a measure of the spread of the disease, not of the age of the disease; that it may represent the more active type of carcinoma, not because the patient has neglected it.

I am in even a worse position than Dr. Robinson because I didn't have forty-eight hours' notice. I knew nothing about the discussion until I arrived here, so I can't inflict you with more figures.

Dr. Horace K. Sowles, Boston, Mass.: I should like to ask Dr. Taylor one question in regard to his age group prognosis, with apologies to Dr. Simmons, because I think his tables partially answer the question. It seems to me that given a carcinoma of the breast in a young person the prognosis is not bad merely because that person is young, because in the young person the resistance is probably better and if a young person developed the disease, it is probably a higher grade malignancy.

It seems to me that, given a hypothetical carcinoma of the breast, the prognosis for that individual carcinoma of the breast is just the same whether the patient is twenty-five or seventy-five years of age.

Dr. Stephen A. Mahoney, Holyoke, Mass.: I see that the title of the paper is "Cancer of the Breast—End-Results." Now the question in my mind is, when are the end-results? Can you simply state when is the end of cancer, in a person who has cancer of the breast?

During the reading of the paper, two cases in my practice came to my mind. Sixteen years ago I operated on a case of cancer of the breast, doing the ordinary radical operation; followed it along for about two years and then the case disappeared. Thirteen years after the operation the patient appeared again in my office with a recurrence at the upper part of the sternum, evidently due to a metastasis in the anterior mediastinum. We gave a fatal prognosis. We had come into the possession of some radium at that time and inserted 50 milligrams of radium into the sternum, going through it, evidently into the anterior mediastinum. That resulted in an ugly slough at the upper part of the sternum. After two or three months that finally healed.

That was three years ago. That patient we saw last week and we would say that she was cured, but the question in our mind is: Is she cured? Are there still cancer cells in that patient that will reappear? So, are there such things as end-results in cancer?

In another case that is now under active treatment, we operated seven years ago, gave the ordinary after-care following along for about two years, and then discharged her as cured. Five years later she reappeared in the office with her side entirely studded with skin cancer, "en cuirasse" type of recurrence. Under x-ray, that has been held in abeyance for the past two years.

Three weeks ago she appeared again in the office with a definite cancer of the opposite breast and we operated on that breast by simple mastectomy, but going up into the axilla. She made a good recovery. Is it an end-result, after seven years?

The question is, when shall we report end-results in cancer?

Dr. Grantley W. Taylor: Dr. Robinson and Dr. Kingman both emphasized the desirability of very careful pre-operative studies in cases of carcinoma of the breast, in the matter of determination of operability.

Dr. Richard Dresser has recently made a study of cases of carcinoma of the breast at the Pondville Hospital, with complete skeletal x-rays, with very interesting findings. That study is in process of publication if it has not already been published. The significant finding he brings out, I think, is that ordinarily three x-ray treatments are adequate for determination of the presence of remote metastasis. He has a plate involving the chest, including the

shoulders, and the dorsal spine, and another of the pelvis and he believes we should have the skull plate, on the ground that the skull frequently was the only place showing the osteometastasis. Seventeen per cent of the breast cases showed osteometastasis with no other evidence of metastasis elsewhere, as contrasted with 14 per cent showing pulmonary metastasis with no metastasis elsewhere.

By taking those three plates, it seems you do all you can to rule out remote disease, always bearing in mind that frequently the patients may have symptoms referable to bone metastasis, especially in the spine, considerably before they will show up by x-ray examination.

Dr. Sowles raised the question of whether the youth of the patient per se has anything to do with the prognosis. I am sorry if my findings gave tnat impression. I said cancer in young people apparently has a poorer prognosis than cancer in older people, I think, and I agree with Dr. Simmons in thinking that that is because the more malignant types of growth tend to occur more commonly in younger people and the more benign types in older people. If you could get two equally comparable types as regards their degree of malignancy, one in a young person and one in an old person, the prognosis in regard to cure would not differ appreciably in those two.

Dr. Mahoney perhaps would point out that the young person's prognosis was poorer as she was going to live longer and so would be more likely to develop late recurrence. Specifically in regard to Dr. Mahoney's point, I think a real mathematician perhaps could take the chartings which Dr. Simmons and I both showed of the survival at intervals after operation in the various groups of cases and plot a curve by which he could tell you what the annual decrement would be after a certain period of time on the basis of a mathematical formula. It would show, as Dr. Simmons pointed out, that about 11 per cent more cases will die of late disease than have already shown evidence of recurrence at the end of five years. That becomes increasingly a smaller percentage as time goes on.

Of course, you can't tell which one of a group of cases will be the one which will carry the residual minute percentage of recurrent disease after the follow-up period.

These two extensive studies, although ostensibly five-year studies, Dr. Simmons has followed for nine years in many cases, and my chart showed an eight-year determination.

DR. CHANNING C. SIMMONS: There are certain other points brought out in the study of these cases. It has been impossible to determine the operability as in the general hospital the inoperable cases are weeded out in the Out-Patient Department and Tumor Clinic and are not admitted to the wards. In the private pavilion no case is referred for surgical treatment unless it is operable.

All cases have a radiographic examination made of the chest and bones before operation to rule out the possibility of remote metastases.

Cases in which the diagnosis can only be definitely established by an exploratory incision are referred to the hospital, and I find that my clinical diagnosis is more often incorrect than was formerly the case.

There is an operative mortality of from 1 to 4 per cent. In the series reported there was one death from pulmonary embolus, an operative mortality of .6 per cent.

Late recurrence, that is recurrence five or more years after operation, is relatively common in cancer of the breast. This is not true in cancer of certain other organs as, for example, the tongue in which recurrent disease after three years is rare, although a second cancer may develop at some point on the buccal mucosa. It is necessary, however, to place some time unit and five years has been generally adopted, with the understanding that approximately 15 per cent of the patients living at the expiration of that time will probably develop late recurrences.

Patients with cancer of the breast have been known to live from 15 to 20 years without treatment after the diagnosis was established. One of the most illuminating papers on this subject was published by Dr. E. M. Daland. He followed 100 consecutive cases of cancer of the breast which received no treatment and found 26 per cent living five years from the onset of the disease. It must be understood, however, that these patients were living with disease and all died within ten years, while of the cases operated upon, living five years, the greater number are living without disease.

DAIRY SCIENTISTS PERFECT METHOD FOR RECOVERING MILK ALBUMIN FOR BABY FOOD

Scientists of the Federal Bureau of Dairy Industry have devised a method and a factory-scale apparatus for recovering milk albumin from sweet whey, with the natural properties of the albumin unimpaired. The Bureau estimates that the powdered albumin can be produced for somewhat less than 50 cents a pound and that its chief value would be as an ingredient of modified infant foods, which commonly retail for about a dollar a pound, or for adding to cow's milk to make it more suitable for infant feeding.

The albumin of milk resembles somewhat the albumin of egg and has high nutritive value. Cow's milk, which contains less than half as much albumin as human milk, has a tendency to coagulate in large masses which digest slowly in the infant stomach; whereas human milk coagulates in the stomach in fine flocks and is easily digested. The addition of the powdered albumin to cow's milk serves not only to raise the albumin content but to change the physical properties of the milk so that when it is acted on by the acids of the infant stomach it is coagulated into a finely divided curd much like that of human milk.

At present albumin is produced in connection with the manufacture of commercial milk sugar from whey, but the albumin has little value because its solubility is destroyed in the separation process. By the new method developed by the Bureau the sugar may be crystallized from concentrated sweet whey, leaving a mother liquor that contains some of the sugar, most of the minerals, and all the albumin. This liquor may be dried without affecting the solubility of the albumin, but the salt content of the resultant powder is so high that it is not suitable for modifying cow's milk. The scientists found, however, that the greater part of these salts can be removed without affecting the other constituents by subjecting the mother liquor to electric dialysis before drying it and they have devised an apparatus in which this can be done on a factory scale.—*Bulletin, U. S. Department of Agriculture.*

OBSERVATIONS ON THE PROBLEM OF MATERNAL MORTALITY*

BY EDWARD S. BRACKETT, M.D.†

THERE is a rapidly growing literature, both lay and professional, on the subject of Maternal Mortality. The former, while well-intentioned, is usually ill-informed. It lays unwarranted emphasis on comparisons between the published maternal mortality rates of this and foreign countries based on governmental registration of births and deaths. The statement has been made and widely quoted that the United States stands almost if not quite at the bottom of the list of civilized countries in its maternal mortality record and the inference is drawn that the American physician as an obstetrician is about the worst in the world. Writers of professional articles on the subject who should know better also fall into the same error. Enthusiastic propagandists for the reduction of maternal mortality, to stress a point, quote statistics without careful analysis or intelligent interpretation and thereby defeat their own purpose. The natural reaction of the profession is too often one of defense rather than a determination to find out and remove the causes of maternal mortality which every unprejudiced investigator must admit is unnecessarily high the world over. Kerr[1] states: "puerperal mortality and morbidity in this country (England) can be reduced by . . . not less than 40%." The available evidence would indicate that the same is true of maternal mortality in this country. We should, therefore, ignoring invidious and unfair comparisons with the published mortality rates of other countries, assiduously apply ourselves to the task of discovering the ultimate causes of puerperal deaths and endeavor to remove the causes found to be preventable. This will be a tedious and humdrum task. No speedy or spectacular results can be anticipated. It means first, the careful investigation of individual deaths, their intelligent classification and analysis and, secondly, a courageous effort to learn the lessons that the facts teach us, put them into practice and, by a well-planned campaign of education, lay them before the profession.

A campaign for the reduction of maternal mortality would seem to demand a definition of what constitutes a puerperal death. There is no agreement at the present time even on that point. The Division of Vital Statistics, Bureau of the Census, Washington[2], sent 1073 identical copies of selected death certificates to twenty-four foreign countries for assignment of the causes of death. Replies were received from sixteen countries. Of the 1073 deaths certified only 431 were attributed by all the countries to a puerperal classification without a contributing cause. Of the 642 remaining certificates, the cause of death was assigned to a non-puerperal condition in percentages ranging from 2.8 to 36.6. Only one country, Denmark (2.8%), assigned fewer deaths to non-puerperal causes than did the United States (11.8%). The interesting fact that Norway (36.6%) and Sweden (33.2%) assigned approximately three times as many of these certified deaths to non-puerperal causes as did the United States somewhat lessens the force of the condemnation of those uninformed propagandists who, to the disparagement of this country, have cited Norway and Sweden as shining examples of countries where obstetricians know their business.

These figures show the futility of trying to compare the quality of obstetrical work in one country with that of another if the comparison is based on governmental statistics. While other sources of error in such comparisons could be pointed out, this confusion in the classification of certificates showing more than one cause of death is a major factor in the wide discrepancies in the vital statistics of the reporting countries. The Census Bureau's Manual of Joint Causes of Deaths eliminates, to a great extent, such discrepancies in statistics as between the states. We may hope that the next Conference on an International List of Causes of Death to meet in 1939 may do as much for international statistics.

However accurate the classification of puerperal deaths may ultimately be, the only interest of the obstetrician is in its practical value. All he wishes to know is why there are so many puerperal deaths so that he may take measures to reduce the number of pregnant, parturient and puerperal women who die each year. What particular form the "statistical expression" shall take is of purely academic interest to the practitioner of clinical obstetrics. Whether it be expressed as "the cost in mother's lives in bringing in to the world 1000 live born babies" or as "the risk of maternity in terms of deaths of women of marriageable age for every 1000 pregnancies, whether these terminate in live births, still births, miscarriages or abortions" or "by the difference between the mortality among the child bearing and that of the non-child bearing women"[3] must be left to the statistician. From the point of view of the practicing obstetri-

*President's address delivered at the annual meeting of the New England Obstetrical and Gynecological Society, November 22, 1933.

†Brackett, Edward S.—Chief of Staff, Providence Lying-In Hospital. For record and address of author see "This Week's Issue," page 871.

cian whatever "statistical expression" is chosen and however the deaths are classified the classification should be such that deaths occurring during pregnancy, labor or the puerperium may be studied as a group irrespective of the primary cause of death and irrespective of the month of pregnancy in which death occurred. We all agree that deaths from heart disease in pregnant women or deaths from sepsis following self-induced abortions should not be called "obstetrical deaths" but all of the latter and some of the former are preventable deaths and are therefore of interest to the obstetrician even though they should not be charged against him. What sub-classifications are useful and desirable must be left to the statistician provided he remembers that statistics are but a means to an end and that end is to give useful information.

As soon as a pregnant woman places herself in the hands of a physician, whether he be a general practitioner or a specialist, he becomes responsible for her welfare until she has completed her puerperium. The specialist may share the responsibility if non-obstetrical complications are present or develop, but he cannot escape it. Many of the most serious problems which the physician has to solve have to do with the complications of pregnancy, namely, heart disease, nephritis, pyelitis, tuberculosis and other acute and chronic diseases, both medical and surgical. Many questions as to the treatment of these conditions can be answered only on the basis of statistical studies. Every certificate of death of a pregnant or puerperal woman, even though the cause of death be non-puerperal, should include a statement that the cause of death was a complication of pregnancy.

Death certificates and statistical tables tell us little or nothing. A death certificate giving puerperal sepsis as the cause of death is of little practical value. If we are to draw any conclusions which will be of use in a fight against a high maternal mortality we must know why the patient became infected. Was her resistance lowered by anemia, diabetes or other constitutional disease; was she harboring the gonococcus in her vagina or cervix; was she, or some member of her family, her physician or her nurse a carrier in the upper air passages of Streptococcus hemolyticus; did manual dilatation of the cervix or an unnecessary forceps operation or version before dilatation and retraction of the cervix open up wide ports of entry for the anerobic streptococcus pyogenes already present in the patient's genital tract; did her physician have under his care a septic wound or a case of infectious disease at the time of her delivery; was the patient allowed to go so long in the second stage that she became exhausted, her resistance lowered and her tissue devitalized to the normally non-pathogenic vaginal flora or did repeated examinations of the vagina transplant the non-pathogenic bacteria of the lower vagina, normally acid, to the normally alkaline cervix where they become pathogenic? When such questions as these are answered we shall know the ultimate causes of puerperal deaths and until we know the ultimate causes we are fighting in the dark. From the clinical standpoint, statistical tables which do not indicate *causes* rather than *results* are useless.

Only a detailed study by a personal interview with the physician while the history of the case is still fresh in his mind can give us any information of real value. Several such studies have been made and others are in progress. While there are many questions which they leave unanswered, they do indicate some points which need to be forcefully presented to the patient, to the medical student, to the hospital resident and to the physician—be he general practitioner, specialist or teacher.

Abortions: All surveys so far made and all statistics compiled are in substantial agreement that approximately one-fourth of all deaths due to strictly puerperal causes follow abortions. Of these one-third are spontaneous and two-thirds are criminal, self-induced or therapeutic. It is somewhat irrelevant, perhaps, but it may be not out of place at this point to remark that self-induced as well as criminal abortions are really infected wounds and should be classified as deaths by violence and not as puerperal deaths. It is estimated that 700,000[4] abortions occur annually in the United States. The average mortality rate for abortions in the civilized world is 2.1 per cent. An induced abortion is probably five times as dangerous as a full-term delivery. In Magdeburg, Germany, the death rate from sepsis following abortions was seven times greater than that following childbirth. Here is one point of attack on maternal mortality; the education of mothers of the great danger of induced abortions.

Chronic Diseases Complicating Pregnancy: About one per cent of all pregnant women have organic heart disease and six to eight per cent of women who die during pregnancy or the puerperium die of heart disease[4]. It is our belief based on our experience in our heart clinic at the Providence Lying-in Hospital that a pregnant woman with heart disease who has never had symptoms suggestive of decompensation can go through pregnancy and labor safely with but moderate limitation of her normal activities. If on the other hand she has edema of the feet and ankles, moisture at the bases of the lungs, shortness of breath on exertion and other signs of beginning decompensation even though she may never have been frankly decompensated, she will if untreated, grow progressively worse and the earlier in pregnancy the symptoms appear the worse the prognosis. If

the patient with this type of heart disease is properly managed by strictly limiting her activities with long periods of rest in bed at the slightest return of symptoms, she will probably do well. On the other hand if there has been decompensation previous to the pregnancy, decompensation will almost surely occur again and it can be prevented only by prolonged rest in bed with proper medication and may require early emptying of the uterus in the most conservative manner possible. The key, then, to the prevention of maternal deaths from heart disease is early recognition of the condition and prompt and adequate treatment. Equally true is it of other diseases complicating pregnancy, tuberculosis, chronic nephritis, hyper- or hypothyroidism, and the toxemias, that only by recognizing them at the earliest possible moment can they be most successfully treated. Here is another weapon of attack in our war on maternal mortality, the constant preaching to the women the necessity of competent medical supervision from the early weeks of pregnancy.

Analgesia: I approach the next specific item in the program of education of the patient with some trepidation. In common with all physicians, particularly those past the half-way station in the journey of life, I have a dread of being considered old-fashioned. At the risk of being so considered, I am going to discuss briefly the subject of obstetrical anesthesia and analgesia from the viewpoint of what I consider the attitude the physician should take in discussing it with the patient. Here again the lay press has done its bit to embarrass the conscientious physician. It has done its best to persuade expectant mothers, and the profession too for that matter, that the obstetrician who will not promise the patient a painless labor is a brute. To shift, to some extent, the onus of being old-fashioned to more distinguished shoulders I shall quote from the recently published Report of the Sub-committee on Factors and Causes of Fetal, Newborn and Maternal Morbidity and Mortality[4]. This is the report of a subcommittee of President Hoover's White House Conference on Child Health and Protection.

"Pain relief of the parturient is desirable but the problem is essentially different from anesthesia necessary for all operations. Relief given to women in labor must be absolutely devoid of danger to either mother or child. Of the various drugs used for this purpose, administered by mouth, rectum or subcutaneously, the overwhelming majority interfere with uterine activity and many pass into the fetal circulation.

"Necessity for the relief of pain is evident. If, however, the method of pain relief lengthens labor or makes its normal termination less likely, justification of anesthesia is questionable. Again, if the method of pain relief adds an element of danger to the child,—such a method is not justifiable.

"By frequent charting of the fetal heart rate and adjustment of the oxygen content of the atmosphere inhaled by the mother, fetal anoxemia can usually be avoided. Whatever the method of pain relief used in obstetrics the tendency to reduce oxygen content of the fetal blood should be remembered and corrective measures instituted when indicated.

"The use of colonic instillation in a mixture of oil recently advocated by Gwathmey, is at present experiencing great popularity. The concomitant use of morphine and magnesium sulphate, both extreme muscular relaxants makes the method highly undesirable in normal obstetrics."

All of which implies that many of the techniques more or less widely used demand special training and experience for their safe employment, require constant supervision of trained assistants in anesthesia and are therefore available, except in a very limited number of cases, only in hospital practice.

Some years ago in discussing the Gwathmey technique with a prominent obstetrician in a distant city, I asked him what he did if a patient failed to deliver herself as soon as he had expected and the effect of the ether began to wear off. His reply was, in effect, that another injection could be given but that as a matter of fact labor had usually progressed so far that he could go ahead and deliver. In other words in that particular clinic they were conducting the labor to suit the anesthetic instead of choosing the anesthetic best suited to the case.

I have singled out for comment the Gwathmey technique not with the thought that it is more or less dangerous than other forms of analgesia but because it has been exploited in the lay press and certain pharmaceutical houses are capitalizing the free advertising it has had and are pushing the sale of the ingredients in handy packages with literature that might tempt one to believe that the only requisite for its safe and successful administration is a right hand strong enough to compress a rubber bulb and insert a hypodermic needle.

What should we tell the patients who do us the honor of placing in our keeping their hopes for a successful labor and a healthy baby when they ask us about this or any other method of mitigating the pains of parturition? I believe we should assert our prerogative of leadership and, instead of servilely following the popular demand of the moment frankly tell them that our first concern is the safety of the mother and the safety of her child. That while we shall do everything within our power to alleviate the pains we will not promise a painless labor if we feel that by doing so we shall run the risk of injuring the mothers or endangering their babies. This subject of relief of pain in labor is one in

which the women are in need of education, not by the lay press, but by their medical advisers.

The problem of the education of medical students is a difficult one and must of necessity be left to the administrative and teaching departments of the medical schools. As one who over a period of some twenty years has had an opportunity in a fairly large lying-in hospital to see the end product of their efforts in the form of internes. Imay be able to speak with some knowledge of their qualifications. That they are very poorly equipped to assume the responsibility of guiding any but the normal woman through pregnancy and labor, their teachers well know. Obstetrics is still an art and not a science. No art can be taught. It must be acquired, under instruction to be sure, but still acquired and that too, only by long practice. No medical school can allot to the obstetrical department either time or clinical material sufficient to make it possible to turn out graduates capable of taking care of any but normal obstetrical cases. If that is a fact (and I believe it is generally admitted to be so), the maximum time should be spent on teaching what normal obstetrics is, only such abnormal obstetrics as is required to contrast it with and emphasize the normal and the irreducible minimum on operative obstetrics. I am not conversant enough with the present teaching of obstetrics to know whether this is the policy generally followed. Probably it is.

What has been said of the teaching of students is true only to a lesser degree of the teaching of internes and any but long-term residents. The practice of allowing a short-term resident to decide if and when operative interference is necessary and turning over to him the delivery without adequate supervision is unjust both to the patient and to the resident. The patient has a right to the best judgment and skill available and the resident has a right to counsel and instruction. A year on the most active obstetrical services is too short a time in which to develop either mature obstetrical judgment or manual dexterity.

To deliver by operation, to demonstrate operative technique on a woman who would otherwise deliver herself normally is, in my opinion, reprehensible in the extreme. The injustice to the patient we can, for the purposes of the present discussion, ignore. It is the injustice to the resident of which I am thinking. Such a procedure minimizes in his mind the possible danger of any interference and fails to impress upon him the fact that the most important thing he can learn is not *how* to operate but *when* to operate. This is particularly important if after graduation he is going to practice, not in a hospital, but in his patients' homes, for the man with sound judgment and average manual dexterity will, in the long run, do better obstetrics than the man with great manual dexterity and poor judgment.

If then, we are to improve our mortality records we must teach the future obstetrician first, what normal labor is, next *when* to operate and last of all *how* to operate.

In considering on what points we, as general practitioners and specialists, need to be educated, it is possible to discuss only a few of the most outstanding of our shortcomings. That we need education is evident. In spite of asepsis, anesthesia and all our modern aids to diagnosis and treatment, we have reduced but little the maternal mortality rate of a hundred years ago and that, too, not because we are dealing with a different type of woman but because we have failed to use wisely or have actually turned against our patients, the weapons which science has placed in our hands. A few years ago I should have resented such a statement but today, being better informed, I believe it to be true.

Prenatal Care: Gardiner[5] in the New York State Survey found that in 30 per cent of the cases investigated, there had been illness which was thought by the attending physician to have possibly affected the outcome. Heart, kidney, and blood diseases accounted for 52 per cent of these. She also found that only 19 per cent of the delivered women had visited a physician before the seventh month.

In another survey it was found that only 54 per cent of the urban white, 39 per cent of the rural white, 20 per cent of the urban colored and 11 per cent of the rural colored who died of puerperal albuminuria and whose condition was reported were in good or even fair condition when they were first seen by a doctor[6].

Child-bearing is not an isolated experience in a woman's life. Her success or failure in the great adventure of motherhood depends upon the sum of all her past experiences and upon the outcome depends in no small degree her future health and happiness. Not until this thought has become rooted in the subconsciousness of every physician and every pregnant woman should we cease to preach the need of prenatal care.

Sepsis: Ninety years after Holmes published his treatise on Contagiousness of Puerperal Fever and over eighty years after Semmelweis reduced his mortality rate in two years from 12.24 per cent to 1.27 per cent (later reduced to .85 per cent), 40 per cent of all puerperal deaths are due to septic infection and of all women who are delivered and die in the last three months of pregnancy 31 per cent die of sepsis[6]. It has already been indicated that not all cases of puerperal sepsis are caused by infection introduced from without. Any operation in obstetrics is carried out in a field that cannot be

sterilized and to which an occlusive dressing cannot be applied. From the placental wound in the fundus to the skin of the perineum there is no bar to infection by the vaginal flora except the natural resistance of the tissues. The genital tract is traumatized to a greater or less degree in every delivery. The greater the trauma and the lower the resistance of the patient, the greater the danger of infection. If this fact were always in the mind of the operator there would be a reduction in the number of operative procedures and a consequent reduction in deaths from sepsis. It might result, too, in greater care not only in deciding between an operative and a non-operative delivery, but also in the choice of the time when the operation should be done. The optimum time for a Caesarian section is before or at the very beginning of labor. The optimum time to apply forceps is after full dilatation and retraction of the cervix and not until the maximum amount of moulding and descent of the head has been accomplished, consistent with the safety of the mother and her child.

Forceps: Answers to the White House Conference Questionnaire showed that in 223 hospitals reporting, the incidence of forceps operations ranged from 0.5 per cent to 81.1 per cent[4]. Such a wide variation in the incidence of any operation is a sad commentary on the present chaotic state of the practice of obstetrics in this country. The average incidence of operative deliveries of all kinds in hospital practice would appear to be between 15 and 20 per cent. It would seem evident that an incidence of forceps deliveries above 10 per cent indicates a belief on the part of the operators that operative deliveries, per se, are harmless. In analyzing eight hospital reports I found that the morbidity, based on the standard of each individual hospital, was from two and a half to nearly five times as great as that following normal deliveries[7]. Even though we have no concrete evidence to show that maternal mortality following forceps deliveries in well-equipped obstetrical hospitals is much higher than that following spontaneous deliveries it seems certain that a high incidence of operative deliveries with its greatly increased morbidity does cause an occasional death from sepsis and accounts for a vast amount of pelvic pathology following childbirth. If this is true in hospital practice, and it is to be noted that all the figures here quoted are from hospitals, it is undoubtedly true of practice outside of hospitals where it is extremely difficult to preserve a strict aseptic technique.

At the deliveries of 942 white women who died of puerperal sepsis, those in charge of the deliveries reported that the technique had been aseptic in 40 per cent; an attempt at asepsis had been made but had failed in 15 per cent; it had been clean but not aseptic in 36 per cent and dirty in 9 per cent.[6] In 45 per cent of the cases, therefore, there had not been even an attempt at asepsis. Whatever may be said in defense of the results of "clean" obstetrics in spontaneous home deliveries, nothing can be said in its defense in operative deliveries. It is to be feared that the operative furore which dominates some of the obstetrical centers has an unwholesome effect on the young men who come under its influence and will shortly go into practice in communities where the hospital facilities to which they have become accustomed will not be available. It would probably be safer in home deliveries not to substitute for, but to supplement asepsis with, antisepsis.

Caesarian Section: In analyzing surveys and hospital reports covering over 43,000 cases I found that the incidence of Caesarian section varied in the different clinics from .5 per cent to 3.36 per cent.[7, 8, 9]. Four other surveys covering 262,853 cases show an incidence of .46 per cent to 1.28 per cent. Ill[9] reports in an analysis of obstetrical work done in Essex County, New Jersey, that, if Newark City Hospital where most of the neglected cases are sent is not included, he found there had been sixty-five deaths in all other hospitals of which 24 or almost 40 per cent followed Caesarian Section. In a survey of Caesarian section in the Cleveland registration area covering five years, published in 1932, Skeel and Jordan[10] found an incidence of 1047 Caesarian sections in 45,650 hospital cases (1 to 44) with a mortality of 7.15 per cent. The incidence in the total cases delivered in that area, both hospital and house, was 1 to 90. They also found that the operative or basic mortality was 1.86 per cent. Any operation carrying a mortality rate of 7.15 per cent of which 26 per cent is due to the operation, per se, and not to the condition for which it is done never should be performed except on definite and serious indications. That at the present time the indications are not definite, an incidence varying from 5 per cent to 14.6 per cent[4] in hospital practice clearly shows.

Bleeding and Toxemias of Pregnancy: It is equally true that there is no unanimity of procedure in the treatment of bleeding and toxemia in late pregnancy. Accouchement forcé (considered by most qualified obstetricians never to be justified) still exacts its toll of maternal deaths. Caesarian section is employed in the treatment of these conditions without proper consideration of the condition of the patient or the type of anesthesia to be employed. In 534 deaths following Caesarian section it was found that the indication for operation was eclampsia in 31 per cent, pre-eclampsia in 9 per cent and uremia in 5 per cent. Placenta praevia and premature separation of the placenta accounted for another 10 per cent. These two conditions,

toxemia and bleeding accounted for 55 per cent of all deaths following Caesarian section. The report of the Study of Maternal Mortality in Fifteen States, says that women with recognized toxemia were kept under observation for long periods and were delivered by emergency Caesarian; women having convulsions were carried long distances to hospitals and operated on immediately on arrival; "both inexcusable procedures".

Let me quote a few published statements of writers on obstetrics.

1. "To expect the forces of the uterus and abdomen directed toward the pelvis and in line with the child's body to provide a rotary movement of the fetal head sufficient to turn it 135 degrees is scientifically unsound.

"At the thirty-sixth week of pregnancy a posterior position of the occiput is present in 45% of vertex cases examined. . . . Out of 18,500 presentations it was found that the posterior position remained so during labor in 363 cases, this being 1.95%"[12].

2. "Prolonged labor occurred less frequently in posterior positions than in anterior positions in my service in the same period of time—due to timely interference".[13] . . . "In a total of 2160 deliveries there were seven persistent occiput posterior positions. What a pity it is that the world cannot understand that occiput posterior positions are best let alone."[14]

3. "If there are sins of commission in the new school they are many times balanced by the sins of omission in the old school."[15] . . . "In New York State the gain which has been made by prenatal care, antenatal propaganda, better, cleaner and more conservative obstetrics in the rural districts, is offset in the hospitals of the urban areas by the great increase in operative deliveries and the complications which follow."[16]

4. "It is really impossible to say a great deal about obstetrics in the United States in a short time. There exists such contrast among the obstetricians and their methods that a generalization from what I saw in one or another of the clinics would give an entirely distorted impression. The strongest conservatism is encountered on one side and the greatest radicalism on the other, the latter predominating."[17]

To reduce the present high mortality rate by the education of the profession seems an almost hopeless task until the leaders of the profession are more nearly in accord on the ultimate causes of maternal mortality and the proper treatment of the specific items which keep up the mortality. The advocates of so-called modern and old school obstetrics must fight it out. This is not the place to get into that fight but it is perhaps allowable to point what, in my opinion, is the proper attitude while the fight is going on.

A radical procedure which may be justified in a modern obstetrical hospital with its rigid aseptic technique and a swarm of trained assistants always on duty, may be absolutely contraindicated in a private house where neither adequate equipment nor skilled assistants are available. Writers whose experience has been limited to hospital practice seem at times to forget this distinction. The practitioner who does obstetrical work in private houses should never forget it.

An obstetrical operation is a surgical operation. No physician can be skilled in all branches of medicine and the practitioner who is not skilled in the art of obstetrics should no more hesitate to call in a consultant who is competent, than he would to call a consultant in any other surgical problem. The consultant should be called in as he is in other branches of surgery not only to perform the operation but to give counsel as to the advisability of interference, the time when interference is demanded and the type of operation to be employed. Too often if a consultant is called at all, the diagnosis is made and his course determined before he has even seen the patient. Such a procedure reduces the consultant to the rôle of a mere mechanic.

If an obstetrical problem arises, no qualified consultant is available and the attendant, as so frequently happens in rural practice, must rely on his own resources, he should in choosing his course of action, give due consideration to his own limitations and to the circumstances under which he must work. Prophylactic forceps, interference, as a routine in occiput posterior positions early in the second stage, have a place, if at all, only in hospital practice.

Many obstetrical conditions require for their adequate treatment early hospitalization. Excessive vomiting in early pregnancy, heart complications, toxemia and vaginal bleeding are such conditions. There seems to be a reluctance on the part of the patient to accept and, on the part of the physician, to insist upon hospitalization of these conditions until the condition of the patient has become serious. Until this prejudice is overcome, lives will be lost which otherwise might have been saved and to that extent a possible reduction in our maternal mortality rate will be prevented.

An obstetrical operation with the possible exception of the extraction of a head already distending the perineum can be done more safely in a hospital than in a private house. An obstetrical operation being a surgical operation, the physician should no more hesitate to insist that his patient go to a hospital for an obstetrical operation than for any other surgical operation.

That, as a rule, mortality records in obstetrical departments of general hospitals are higher than in obstetrical hospitals or the home, may be due, among other factors, not so much to the danger of air-borne infections as to the fact that

while in the home many considerations may urge delay in operating until there is a definite indication, in a hospital an operation is so easy and, to the unthinking, so safe that a few unqualified and inexperienced men are tempted to interfere unwisely in the normal process of labor and thereby raise the hospital mortality rates.

If what I have said seems pessimistic and fault finding, it is due to the subject I have discussed. If we are to lower the maternal mortality rate we must find our faults and our mistakes before we can correct them and how can one point out faults and not be fault finding? There are many bright spots on the obstetrical horizon. It would be pleasant to point out hospital after hospital where in spite of the grave emergency cases treated, the mortality rate is thirty or less per 10,000 living births, and less than half the country-wide rate. In such hospitals prenatal and postnatal clinics, anesthesia, analgesia, sepsis, forceps, Caesarian section, and all the modern aids to diagnosis and treatment are weapons which are being wisely used. That they are not always wisely used, our mortality rates show. It is their misuse that must be found and exposed and that cannot be done by the piling up of undigested governmental statistics. It can only be done by such studies as have been made in Cleveland and New York (among others) and by the Children's Bureau in Washington where they have gone back of the death returns to the individual cases. No vague campaign of education will do. Specific problems must be solved and specific abuses attacked. And let it not be forgotten that, if the maternal mortality is lowered, it will follow as the day follows the night that the whole standard of obstetrics will be raised.

REFERENCES

1 Kerr, J. M.: Maternal Mortality and Morbidity, Their Problems. 1933. William Wood & Co.
2 Hemmings, C. T.: Survey of 1253 consecutive deliveries. Ohio State M. J. 29:97 (Feb.) 1933.
3 Emerson, H.: Factors leading to the misinterpretation of maternal mortality rates. Am. J. Obst. & Gynec. 23:605 (April) 1932.
4 White House Conference of Child Health and Protection; Fetal, Newborn and Maternal Morbidity and Mortality. 1933. Appleton Century Co.
5 Gardiner, Elizabeth M.: Maternal Mortality. New York State J. Med. 32:1414 (Dec. 15) 1932.
6 Maternal Mortality in Fifteen States. United States Department of Labor. Children's Bureau. Bureau Publication No. 223. Washington 1933.
7 Bailey, Harold: Report of five years' activities of maternity service, Second (Cornell) Division, Bellevue Hospital. Am. J. Obst. & Gynec. 15:462 (April) 1928.
Starr, S. H.: Report of obstetrical service of Louisville City Hospital for year July 1, 1929 to July 1, 1930. Kentucky M. J. 29:281, 1931.
Epstein, H. J., and Fleischer, A. J.: "Sane" obstetrics. J. A. M. A. 97:219 (July) 1931.
Reports of the Rotunda Hospital, Maternity, Gynaecological & Pathological. Irish J. M. Sc., 6th series. 1928, p. 337; 1929, p. 329; 1930, p. 325; 1931, p. 337; 1932, p. 381.
8 Willite, Paul W.: Analysis of the obstetrical work at Blodgett Memorial Hospital January 1, 1925 to December 31, 1929. Bull. Am. College Surgeons. 16:28 (March) 1932.
Randall, L. M.: Annual report of section of obstetrics for 1931. Proc. Staff Meet. Mayo Clin. 7:93.
Tracy, Stephen E., and First, Arthur: A review of 1001 cases. Jewish Maternity Hospital, Philadelphia. Am. J. Obst. & Gynec. 16:51 (July) 1928.
9 Ill, Carl H.: An analysis of obstetrical work done in Essex County, N. J. Hospital for the year 1927-28-29. Am. J. Obst. & Gynec. 22:129 (July) 1931.
10 Skeel, A. J., and Jordan, F. F.: Consideration of cesarean section, with survey of 1047 cases in the Cleveland Registration area in five years. Am. J. Obst. & Gynec. 23:172 (Feb.) 1932.
Bolt, Richard A.: Maternal mortality study for Cleveland, Ohio. Am. J. Pub. Health. 23:109 (Feb.) 1933.
11 Bill, A. H.: The treatment of the vertex-occipito posterior position. Am. J. Obst. & Gynec. 22:615, 1931.
12 Dearnley, Gertrude: Treatment of posterior positions of the vertex. Lancet (Quoting the Queen Charlotte's Practice of Obstetrics). 2:919 (Oct.) 1930.
13 Vaux, N.: The method of delivery and end-result of 212 cases of occiput posterior positions. Am. J. Obst. & Gynec. 20:782 (Dec.) 1930.
14 Solomons, Bethel: Report of Rotunda Hospital, Nov. 1, 1930 to Oct. 31, 1931. Irish J. M. Sc. 6th series. 80:381.
15 Bill, A. H.: The newer obstetrics; presidential address. Am. J. Obst. & Gynec. 23:155 (Feb.) 1932.
16 Polak, John Osborn: Maternal and early infant care. Am. J. Obst. & Gynec. 21:852, 1931.
17 Phillip, E.: Geburtshilfe und Gynäkologie im U. S. A. Zeitschrift für Geburtshilfe und Gynäkologie. 97:323, 1930. Also, München. med. Wchnschr. 77:320 (Feb. 21) 1930.

HEALTH INSURANCE IN ENGLAND

BY SIR HENRY B. BRACKENBURY, M.D.*

TWENTY-ONE years' actual experience of giving and receiving medical advice and treatment under a system of compulsory and contributory national health insurance has had certain definite results both upon the community and upon the medical profession. It must be understood by American readers that the British health insurance system has from its beginning in 1912 included in its medical benefits only the services of a general practitioner in the patient's home or at the doctor's office; that it does not include the services of specialists or hospital care. In addition to medical benefits, cash benefits amounting to a part of the wages are provided the insured person for a specified period during sickness. All persons employed at manual labor, and all other employed persons with annual incomes of less than £250 are legally required to insure under the Act, these employees paying themselves approximately 40 per cent of the total cost, the employer paying about the same amount, and the state the remaining fifth. Over 15 million persons are thus insured under the law and about 15,000 physicians have elected to serve them under its provisions, these physicians ordinarily giving only a part of their time to insurance practice and carrying on private practice also.

On the whole, and leaving out of account for the moment those features of the British system which are not directly concerned with the provi-

*Brackenbury, Sir Henry B.—Chairman of Council British Medical Association. For record and address of author see "This Week's Issue," page 871.

sion of medical attendance and treatment, the results are beneficial to both: and when the expression "on the whole" is used it is not intended to imply that the benefit is just on the right side after nicely balanced consideration, but merely that there are some points of disadvantage which may be set over against an overwhelming preponderance of advantage. That this is so may be judged from the official resolution passed by the Representative Body of the British Medical Association almost without dissent: "The measure of success which has attended the experiment of providing medical benefit under the National Health Insurance Acts system has been sufficient to justify the profession in uniting to secure the continuance and improvement of an insurance system." It is some eight years ago that this resolution was passed, but since then it has been endorsed, further resolutions have been adopted pressing for an extension of the system to bodies of persons who are not at present included in it, and by a growing conviction, born of intimate experience, it is acknowledged that any suggestion of the abolition of the scheme would be received by an overwhelming and emphatic protest from the profession and insured population alike.

It is important to emphasize the official and definite character of these and the following expressions of opinion of the medical profession of Great Britain in view of the different and incorrect impressions which have been conveyed to American physicians in certain British "correspondence."

There is a similarly official record of what the medical profession believes to be the general benefits to the community which have been either directly due to, or greatly accelerated by, the National Health Insurance scheme. In the Memorandum of Evidence which the British Medical Association presented to the Royal Commission on National Health Insurance they are thus enumerated: "(a) large numbers, indeed whole classes, of persons are now receiving a real medical attention which they formerly did not receive at all, (b) the number of practitioners in proportion to the population in densely populated areas has increased, (c) the amount and character of the medical attention given is immensely superior to that formerly given in the great majority of clubs, (d) illness is now coming under skilled observation and treatment at an earlier stage than was formerly the case, (e) the work of practitioners has been given a bias towards prevention that was formerly not so marked, (f) clinical records are being provided which may be made of great service in relation to public health and medical research, (g) coöperation among practitioners is being encouraged to an increasing degree, (h) there is now a more marked recognition than formerly of the collective responsibility of the profession to the community in respect of all health matters." These are described as "immense gains," and further experience has not tended to minimize the value of any of them. The only qualification perhaps required is that, except in a few instances, the authorities have failed to make proper use of the potential value of the clinical records made by practitioners. It may be added that in a number of rural areas it has been found possible to maintain medical attention in places which would otherwise have been left derelict.

Such are some of the main benefits to the community. It is natural to ask also whether there is any evidence, as yet, that the general public health has been enhanced as a result of the working of a National Health Insurance system. This is a question, however, which it is impossible to answer, and probably will always be impossible to answer, with any degree of confidence. There can be but little doubt that during the past twenty-one years, in spite of war and economic calamities, the national health has improved; but it is quite impossible to separate the effects of the medical benefit insurance arrangements from those of other agencies which have contributed, probably more effectively, to such a result—for example, an increase of knowledge of medicine and ancillary sciences, a more effective and widespread public health administration, a much greater realization of the importance of health matters, and education in personal, domestic, and industrial hygiene. It will be realized, however, that the beneficial effects of these other agencies must have been largely augmented and reinforced by the activities of the physician doing insurance work, without whose services they would have failed of practical application in the homes of the people.

On the other hand, the fact that the provision of cash benefits payable during incapacitating sickness has led to increased claims cannot be taken as indicating any actual deterioration in the general health. It must be borne in mind that the insurance scheme applies to not much more than one-third of the population, that the effects of prolonged unemployment and the aftermath of war are still with us, that the propaganda in favor of securing early medical attention and of realizing the importance of minor illness must at first tend to swell the periods of sickness, and that the recent actual prolongation of life almost necessarily increases the total of such periods. These and other purely medical considerations fully account for an increase in sickness claims. Whatever be its actual effects on the public health there is no doubt at all that the insurance scheme has brought to large numbers of persons the advantage and comfort of having a family physician or private medical adviser in whom they have confidence.

The results to the medical profession itself have also been, in general, advantageous. The

system has, in almost all areas and in the case of a large proportion of individual practitioners, increased the feeling that we are colleagues rather than rivals, and has brought about a more conscious relationship between family practice and various aspects of public health service. These are considerable gains. Financially, too, the effects have been beneficial. The aggregate income of members of the profession practicing under the scheme has been largely augmented. There are probably thousands of general medical practitioners today who, without the insurance scheme, would not have been able to earn by the exercise of their profession a sufficient income on which to live. It must not be understood that any money is coming to them through these state insurance arrangements which they have not fully earned. It is the greatly increased amount of work which the scheme provides for a guaranteed reasonable (though some think not a fully adequate) payment that has led to this improvement. In addition, a large number of physicians find it a relief and comfort that they can now give a fuller attention to many of their poorer patients without the thought that those patients will be afterwards distressed by the presentation of a bill. There is not evidence that the general quality of professional work has in any way deteriorated. No doubt, as in other branches of medical work, there are some who are less skilful and less conscientious than others; but comparing like with like, the best with the best, or the average with the average, it is safe to say that the quality of the service rendered is at least as high among insurance doctors as it is, say, in private practice or in hospital outpatient departments.

It is not to be denied that there are certain drawbacks, dangers, or disquieting features which may be found under an insurance scheme for medical benefit. The most commonly mentioned among those which are real, is the multiplicity of rules and regulations which it involves. No doubt there is a tendency to multiply and complicate these unnecessarily, but it should be realized that most of them arise from three extremely valuable, and probably unique, features embodied in the English system. These are (1) Every registered medical practitioner has the *right* to be a member of the service unless and until it is proved that, because of misconduct, his continuance therein is detrimental to the service as a whole; (2) the close approximation of the conditions of the service as between doctor and patient to those which obtain in private practice; (3) the considerable share assigned to the profession itself in administration. Because of, not in spite of, the confidence in the profession which these features disclose, provision has to be made for the occasional delinquent. If the state has no right to choose which physician shall take part in the service, machinery has to be established for dealing with anyone who conspicuously fails in his duty. If the state has limited its function to bringing together doctor and patient, leaving them free thereafter to act in accordance with recognized or traditional methods, it must provide means whereby, in case of dispute, each may have a square deal. If the state leaves purely medical matters to be judged by a purely professional body, there must be some authoritative delimitation of the respective spheres and some prescribed means for action. All these statutory requirements, rules, and regulations, need not trouble the physician any more than the ordinary requirements of the penal code trouble the law-abiding citizen. In fact, they do not worry him overmuch; they exist largely for his own protection. There is, however, a certain type of mind which tends to be distracted by them, and therefore they should be made as simple and few as possible.

Only two other drawbacks or dangers need be considered—the one affecting the attitude of certain members of the profession, the other affecting the mind and conduct of certain insured persons. The one is that the system does to some extent facilitate the procedure of commercially-minded practitioners, and the exploitation of unwary members of the profession by ingenious laymen. There is no doubt that insurance practices are more easily and more certainly transferable than ordinary private practices. On the occasion of any such transfer each insured person on a physician's list is afforded the opportunity of choosing another physician, but, in fact, only a very small proportion of them (perhaps 3 to 5 per cent) avail themselves of this at an early date thereafter. This allows of such practices being worked up in suitable areas and then, perhaps at short intervals, being bought and sold as commercial propositions. This danger, however, cannot be said to be prevalent, and it is one which knowledge and experience should easily combat.

The other drawback is that with a quite small proportion of insured persons, their attitude towards their physician may be changed for the worse. Instead of regarding him as a confidential friend and adviser there are a few who come to demand his services as a business right and may be critical and suspicious lest they should not secure their full due. If there were any widespread effect in this direction it would be enough to condemn the whole system, but in fact the enormous majority of insured patients enter into relations with the physician of their choice in exactly the right spirit, and such an attitude as that described is not common and can be readily dealt with by any wise practitioner.

Other supposed drawbacks or dangers are either unreal, or trivial, or not peculiar to in-

surance practice but more or less common to many forms of medical work.

In conclusion, if, as the result of the British experience, one were to offer any advice to members of the profession or other persons interested in public health elsewhere, one would feel inclined to say with a good deal of emphasis, that, whatever variation there might be in many details of any proposed insurance health service, certain conditions should be regarded as essential for smooth working and success.

First the three unusual features of the English scheme mentioned above should be regarded as absolutely fundamental—the right of all doctors to be members of the service, the absence of interference between doctor and patient as such when once this relationship has been brought about; the close and appropriate association of the profession itself with the administration.

Secondly, the scheme for provision of medical benefit (i.e., medical advice and treatment) should be separated as completely as possible, both financially and administratively, from any insurance provision for cash payments of any kind.

Thirdly, the scheme should, from the beginning, make provision for a full medical service, not merely for general practitioner attention but also for consultant, specialist, and other ancillary services, and, where circumstances allow, for institutional treatment also. Because of historic reasons which govern the provision and maintenance of the institutional care of the sick in Great Britain, it is found impossible in this country to incorporate hospital provision as an integral part of an insurance scheme, but practicable, however, to secure such provision in direct and intimate association therewith.

Fourthly, the scheme should be administered as simply as possible in topographical areas, and not through a multiplicity of "approved societies." In Great Britain, owing to the vested interests which have already been established, it is recognized that Approved Societies may require to be represented on whatever local committees administer the scheme. Most of the difficulties and complications that have from time to time arisen under the existing English scheme have been due to the fact that these last three conditions have not been fulfilled; and the British Medical Association in the spring of 1930 issued "Proposals for a General Medical Service for the Nation," incorporating the above stated general principles and urging the extension of the sickness insurance law to cover not only the insured employees themselves but also the members of their families, to provide the services of specialists as well as of general practitioners, and to arrange for hospital care, as measures for increasing the provision which the present law furnishes for attending to the health of the people by securing full medical attention for them. Financial stringency has prevented any attempt to establish such provision during the past three years, but the scheme has been very favorably received in general, and it is under discussion by societies and authorities interested in the public health.

SNAPPING THUMB IN CHILDHOOD*

Report of Eight Cases

BY HENRY W. HUDSON, JR., M.D.†

THERE are several lesions which may cause flexion deformity of thumb or fingers. Among them are stenosing tendovaginitis, alterations in the phalanges or inter-phalangeal joints, peripheral nerve injury, neoplasm of tendon or tendon sheath, cicatricial and ischemic contractures, and division of opposing tendons. Since effective treatment presupposes recognition of cause and, since in a recent experience with one etiologic factor a correct diagnosis was made in none of eight cases before hospital entry, consideration of that type is pertinent. Furthermore the observation of eight cases in children within a two-year period is a unique experience if one may judge from standard texts and the scant literature. Certain conclusions may be drawn from this experience which are at variance with the usual statements concerning etiology.

The deformity, with which we are concerned, consists in a flexed position of the distal phalanx of the thumb which is overcome by active extension with difficulty, if at all, and recurs promptly. Passive or active (when possible) extension is accompanied by a palpable, and frequently audible, "snap" or "click" which is often painful. Palpation of the flexor tendon frequently reveals a localized fusiform thickening just proximal to the metacarpo-phalangeal joint.

The diagnosis is made readily without elaborate investigation and a simple surgical procedure is effective in the relief of deformity.

Compere,[1] in a recent report, vividly describes his case, which except for the age of his patient, appears to be identical to those we have seen. His illustrations are very clear and worthy of examination. He classifies his case as one

*From the Surgical Service of the Boston Children's Hospital, and the Department of Surgery, Harvard Medical School.

†Hudson, Henry W., Jr.—Assistant Surgeon, Boston Children's Hospital. For record and address of author see "This Week's Issue," page 871.

of tendonitis stenosans and apparently considers flexion deformity due to local tendon enlargement or to local tendon sheath stenosis as fundamentally the same. He separates this condition, however, from that described by de Quervain[2] as limited to the common tendon sheath of abductor longus and extensor brevis pollicis tendons. The condition described by de Quervain was later shown to involve any of the tendon sheaths about the wrist or hand. Finkelstein[3] was able to produce this lesion in rabbits by trauma or by chemical injury and regarded it as the result of aseptic inflammation. He emphasized that the pathologic change is fibrous thickening of the tendon sheath and states that *it is rare for the lesion to occur in the tendon itself.* In one of his cases a localized tendon enlargement was noted. Both Compere and Finkelstein found little American literature concerning this lesion, but both felt it was not uncommon. Compere reviewed forty cases and reported an additional one. Of the forty, *only eight were six years of age or less,* and thirty-three of the thirty-six in which the sex was stated occurred in females! Seventeen of the cases resembled those we have seen.

In Keen's[4] Surgery the author offers the names trigger-finger, and lock-finger, and states that it is rarely congenital and is more often associated with trauma, gout, overuse, and arthritis deformans. He advances circumscribed tendon thickening, new growths, protuberance of joints, and narrowing of tendon sheath as etiologic factors. Da Costa[5] describes trigger-finger, jerk-finger, lock-finger, snapping-finger, as associated with rheumatism, ganglia, enchondromata, tendon synovitis, tendon sheath thickening, and (quoting Tubby) enlargement of tendon. Babcock[6] speaks of snap-finger, trigger-finger, spring-finger, as affecting, in order of frequency, the middle and ring fingers, the thumb and index finger. He mentions tendon callus as causative in 90 per cent, and adds contracture of sheath, sesamoid bone or ganglion, and alteration in joint surfaces as other causes. Ochsner[7] states that the condition is rare, that it may affect fingers or thumb, and that it is due to localized tendon thickening or sheath narrowing, or both. Bickham[8] recognizes the lesion and recommends shaving the tendon or enlarging its sheath or excising the *obstructing nodule.* Ashurst[9] gives the usual cause as a *fusiform thickening* of one of the flexor tendons. Bunnell[10] describes a *small benign nodule* containing giant cells and believes it the result of slight trauma. Homans[11] calls attention to Nélatons "doigt à ressort" described about 1850 and states that the patients are usually elderly. All agree that the condition is rare in childhood and Finkelstein stresses its relation to manual work. It is usually stated to be much more common in the female.

Cotton[12] reported a case of trigger-finger in which operation was successful and stated that up to that time (1911) there were about 160 cases on record with operative data in forty. He added "a couple of cases have been reported as congenital in origin". Most, however, were middle-aged persons and the female was more frequently affected than the male. Trauma and occupation were regarded as important factors. Cotton emphasized that the important thing was disproportion between the tendon and its sheath and stated that this was possible either from localized tendon enlargement or localized sheath stenosis.

In contradistinction to the usual statements regarding age, sex and cause, we offer eight cases (two bilateral) seen within two years*, all occurring at age three or earlier, with no distinctive sex incidence, and all with the same etiologic factor—localized tendon enlargement leading to disproportion between the tendon and its sheath. In all these the flexor pollicis longus was affected. In only one instance was there a definite history of trauma and in no instance had the fingers or hand been used in an abnormal fashion. In one case a familial incidence was recorded. Six of the eight cases, including both the bilateral instances, were proved by operation.

CASE REPORTS

No. 150401 A. C. a white female of 4 9/12 years reported to the Surgical Out-Patient Department June 23, 1931. About two years before, the child had struck her right thumb "end on" against an opening door. She cried for a short time and then returned to play. About one week later the mother noted that the child held her spoon awkwardly. She was advised to bathe the thumb in hot water for twenty minutes each day. Under this treatment the thumb could be extended easily but within 10-15 minutes it would again become flexed. Later the thumb remained flexed and, if passively extended, was painful.

On examination the distal phalanx was held flexed at about 45 degrees. Efforts to extend the phalanx were accompanied by pain and the examiner considered the tendon short. Abduction was limited with the phalanx flexed and there was further limitation of abduction if the phalanx was extended.

Operation was performed July 27. The tendon of the flexor pollicis longus was exposed. A "thickened substance" resembling cartilage was noted in the tendon opposite the metacarpo-phalangeal joint. This was removed, the wound sutured and the thumb splinted in an extended position.

Active motion was instituted 24 hours later. The wound healed well and the child was discharged August 4.

Active extension was possible within 48 hours after operation. The child was followed until September 1933 (22 months). Movements of the thumb were considered normal.

Histologic examination of the excised tissue (S-31-237) showed fibrous and fatty tissue, the fibrous tissue resembling scarred tendon.

*During this period an additional patient was seen in whom the flexor sublimis digitorum (III) was similarly affected.

No. 150875 S. B. a white female of three months reported to the Surgical Out-Patient Department July 6, 1931 because of a deformity of the thumb noted one week earlier. The terminal phalanx of the right thumb was held flexed at about 45 degrees but could be passively extended. The tendon of the flexor pollicis longus was considered "tight". Passive extension was recommended and the infant was followed for three weeks during which there was improvement. An attempt to follow this patient was unsuccessful.

No. 151701 F. I. a white male of six years reported to the Surgical Out-Patient Department July 30, 1931. From infancy (one year) his mother had noted his inability to extend the distal phalanx of either thumb. There had been no pain and he had suffered no inconvenience until he entered school when it was difficult to teach him to hold a pencil.

A similar flexion deformity was noted and attempts to extend the phalanx were unsuccessful. When forced toward extension, the thumb dislocated at the metacarpo-phalangeal joint. Again, the examiner considered the tendon to be short.

On August 8, the tendon was exposed. Opposite the metacarpo-phalangeal joint the tendon was thickened and could not be moved freely. A segment of the sheath was removed with relief. Similar operations were done on the two tendons. The tendon thickening was more marked on the right side.

Active motion was allowed within 24 hours. The wounds healed well and the boy was discharged in ten days with full motion in the left thumb but with slight loss of full extension on the right.

He was followed until October 26 (two months). At that time the function of the left thumb was normal. The right thumb was extended but there was loss of flexion.

No. 149745 H. D. a white female of 1 5/12 years was admitted to the surgical wards November 10, 1931 for repair of an umbilical hernia. An incidental observation was a deformity of the left thumb whose distal phalanx was held flexed at 45 degrees and could not be extended actively or passively. No operation was performed on the thumb but exercises were prescribed. On September 15, 1933 (22 months later) there was no improvement. Operation has not been done because of a social problem.

The mother, maternal grandfather, and maternal great-grandmother were all said to have "curved" little fingers which could not be "straightened".

No. 153797 R. McM. a white male of 4 6/12 years was admitted to the surgical wards January 22, 1932. At 1 3/12 years, without history of injury, a flexion deformity of the right thumb was noted. It persisted, without change, despite forceful passive extension and splinting carried out on several occasions a year before he was brought to the hospital.

The typical deformity was present, active extension was impossible, and one examiner considered the tendon prominent.

January 22, under ether anesthesia the distal phalanx was extended. Extension was accompanied by an audible and palpable "snap". A local tendon enlargement was palpable. A splint was applied to maintain extension. Within a few hours the child had loosened the splint and his deformity had recurred. The following morning, without anesthesia, the phalanx was again extended, again with an audible and palpable "snap" and transient pain. No splint was applied. In two hours there was recurrence. No swelling followed either manipulation.

January 26 operation was performed. A globular enlargement of the tendon of the flexor pollicis longus was demonstrated. It caused disproportion between tendon and tendon sheath. A segment of the sheath was excised.

Active motion was allowed in 24 hours. There was relief of deformity. The child was followed for 21 months. Motion was normal.

No. 107404 O. A. a white female of 6 4/12 years entered the surgical wards September 8, 1932. When she was about two years old, her mother noted that the left thumb was not straight. This persisted. At age three a similar appearance was noted on the right side. From time to time the child would passively extend these distal phalanges, but flexion of 45 degrees promptly returned. There was no pain. There was no history of trauma or infection.

The usual deformity was present on either side. A firm tendon enlargement was palpable opposite either metacarpo-phalangeal joint.

On September 9 both tendons were exposed and a fusiform enlargement noted "just distal to the point where the tendon sheath began". The sheaths were incised which allowed the enlargement "to slide freely back and forth" and "permitted complete extension". Splints were applied for 24 hours. Thereafter active motion was allowed. Within three days normal motion was present.

On September 23 and 30 normal motion was present. On April 20, 1933 she reported with a recurrence on the right side. The movements of the left thumb were normal. The recurrence was said to have been noted six weeks after operation. It resembled the original deformity except that local tendon thickening was not palpable.

On August 17 the tendon of the right flexor pollicis longus was again exposed. The local enlargement present a year before was no longer present. With the distal phalanx completely extended the tendon was free to move in its sheath.

The child was discharged, unimproved, August 26. On September 18 she reported with a wound infection which had developed during chicken pox and had been discharging for several weeks. A silk suture was removed. On September 21 the wound was healed. The left thumb was normal. There was flexion deformity of the right thumb.

No. 166166 D. B. a white male of 2½ years was admitted to the Orthopedic Service on January 4, 1933. Two months earlier a flexion deformity of the right thumb had been noted. There was no history of preceding injury or illness. No abnormal use of the thumb had been noted. The child was a thumb sucker but this was confined to the left and not to the affected thumb. The deformity remained unchanged from the time it was first noted until admission except for slight temporary improvement under massage.

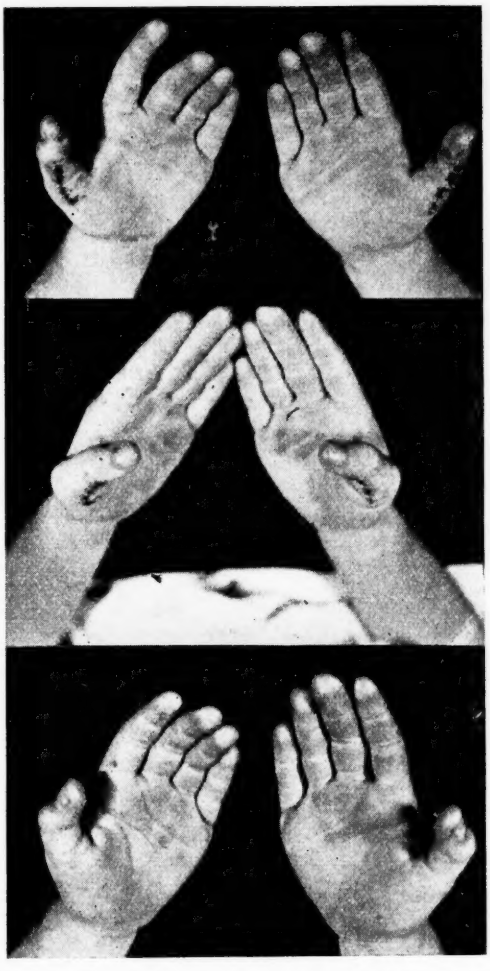
Local examination revealed a 45 degree permanent flexion deformity of the right thumb. Flexion was not limited but extension was possible to 145 degrees only. Passive extension to nearly 180 degrees was possible but the 45 degrees of flexion promptly recurred.

On January 6 the flexor tendon was exposed and its sheath incised. "In the deep portion of the sheath at the metacarpo-phalangeal joint a small fibroma" measuring about 0.5 cm. in diameter was found. It was adherent to the tendon. It was removed and immediately full extension was possible.

The child was followed until September 30 (nine months). The flexion deformity was entirely corrected but there was loss of active flexion of the distal phalanx. Other motions were normal.

The histologic report (S-33-3) follows. "One section shows heavy bands of dense connective tissue in which few nuclei are found. At one edge the

fibrous tissue merges with an area of hyalin cartilage. In the transition from the connective tissue to the cartilage there is a small amount of fibrocartilage noted. At some distance from the area of cartilage just described there is a small amount of fibrocartilage lying in connective tissue and merging gradually and almost imperceptibly with the fibrous tissue. The picture is consistent with a congenital anomaly of development and can be best described by the term cartilaginous transformation of fibrous tissue."



The lower photograph shows the flexion deformity of the distal phalanx. The upper two show the active motion possible two days after operation.

No. 172273 R. B. a white female of 1 10/12 years was admitted to the surgical wards on June 27, 1933. For two months, flexion deformity of the left thumb had been noted. There was no history of trauma. At times active extension had been possible but more frequently the distal phalanx was flexed at about 45 degrees and could not be extended. A palpable localized enlargement of the flexor pollicis longus was present opposite the metacarpo-phalangeal joint.

On June 28 the tendon was exposed through a one inch incision, the sheath was incised, and an oval localized tendon enlargement demonstrated. The sheath was resected for about ¼ inch.

There was immediate relief of deformity and motion was normal.

The child was followed until September 16 (3 months). Motion was normal. The *tendon thickening palpable before operation was no longer palpable.*

This experience suggests that those instances of snapping thumb or finger due to localized tendon enlargement represent instances of developmental aberration in the tendon or its sheath, or both, possibly with hereditary transmission, and that age, trauma, and occupation are contributory and not causative factors.

REFERENCES

1 Compere, E. L.: Bilateral snapping thumbs. Ann. Surg. 97: 773 (May) 1933.

2 de Quervain, F.: Quoted by Compere and Finkelstein[3].

3 Finkelstein, H.: Stenosing tendovaginitis at radial styloid process. J. Bone & Joint Surg. 12: 509 (July) 1930.

4 Keen, W. W.: Surgery. Saunders, Philadelphia. 1906.

5 Da Costa, J. C.: Modern Surgery. Saunders, Philadelphia. 1914.

6 Babcock, W. W.: A Text Book of Surgery. Saunders, Philadelphia. 1928.

7 Ochsner, A. J.: Surgical Diagnosis and Treatment. Lea & Febiger. Philadelphia and New York. 1920.

8 Bickham, W. S.: Operative Surgery. Saunders, Philadelphia. 1924.

9 Ashurst, A. P. C.: Surgery. Its principles and practice for students and practitioners. Lea & Febiger. Philadelphia and New York. 1927.

10 Lewis, D.: Practice of Surgery. Baltimore, 1933.

11 Homans, J.: A Text-Book of Surgery. Thomas, Baltimore. 1931.

12 Cotton, F. J.: Trigger-finger. Am. J. Orthop. Surg. 8: 587, 1910-11.

STRANGULATED INGUINAL HERNIA, WITH UNUSUAL COMPLICATIONS, IN AN INFANT OF FIVE WEEKS

Report of A Case

BY J. L. GOLDEN, M.D.,* AND H. H. HAMILTON, M.D.*

W. H., a well-developed and well-nourished, male infant, five weeks of age, full-term, normal delivery, breast-fed, present weight of 8 lbs. 2 ozs., with no previous history of illness, was brought to the hospital by his mother, with the following history:

Friday morning, two days before entry, the patient was irritable, crying hard and often. The irritability continued throughout the day, but there was no vomiting and the bowel movements were normal. The following day, vomiting began and occurred a few minutes after each feeding. It was projectile in nature. Sunday morning, the day of entry, the diaper was noted stained with pink fluid. There had been no bowel movements since noon the day before. Vomiting persisted and was now brownish in color. The odor was not noted. For the first time, 48 hours after onset of symptoms, a mass, the size of a walnut, was noticed by the mother in the right groin.

On admission, a slightly dehydrated, drowsy infant was presented. Head, chest, and extremities showed no abnormalities. Extending from the mid-inguinal region into the upper half of the scrotum

*Golden, J. L.—Assistant Surgeon, Malden Hospital, Malden. Hamilton, H. H.—Resident Surgeon, Malden Hospital, Malden, Massachusetts. For records and addresses of authors see "This Week's Issue," page 871.

on the right was an ovoid mass about two inches long and one inch in diameter. The skin was reddened over the lower half of the mass, and the redness extended down over the entire right half of the scrotum. It did not transilluminate, was indurated, and showed a slight amount of pitting edema. When it was touched, the child cried out. Attempts at reduction were considered inadvisable. Rectal temperature on admission was 99.5°, pulse 140, WBC 15,000. The patient cried out sharply and writhed for a few seconds every two or three minutes, remained quiet between the attacks, and often dozed off to sleep.

Preparation for operation was made at once. Shortly after entry a small amount of greenish material was vomited. A soap suds enema returned with good results. The preoperative diagnosis was strangulated right inguinal hernia.

OPERATION

Under ether anesthesia, the field was prepared with a mercurochrome-acetone-alcohol solution, and a two and one-half inch incision was made one-half inch above and parallel to Poupart's ligament. The tissue layers were identified and divided down to the inguinal canal, where a hernial sac about two inches long and one inch in diameter was found extending from the internal inguinal ring into the scrotum. On opening the sac, a small amount of serosanguineous fluid escaped. The right testicle, with the spermatic cord, was found included in the sac, and these structures were gangrenous up to a point about one-half inch from the internal ring. The testicle had the appearance of a small, ripe olive. Superior to the testicle was about two inches of small bowel, the ileocecal valve, and a small portion of the cecum in the sac, forming a loop extending down to the testicle. On separating the loop of bowel, the appendix was exposed, lying free in the hernial sac, markedly injected, porky and edematous. The appendix and its mesentery were ligated with atraumatic catgut, removed, and the stump carbolized. It was found impossible to reduce the herniated bowel, which was moderately injected and edematous, but evidently in a viable state, until the internal abdominal ring was enlarged superiorly. Reduction was then perfected, and the neck of the sac closed by mattress atraumatic sutures. As circulation in the testicle and spermatic cord had shown no tendency to return, these organs were next removed. Anatomical repair was then done, the external oblique fascia being overlapped and plicated. Dermal suture was used on the skin. A small rubber wick was inserted into the scrotum through the lower end of the wound and left in place for 24 hours. A collodion dressing was applied.

PROGRESS

The temperature rose to 103.5° on the day following operation, and there was a watery diarrhea of about twelve bowel movements during the first 24 hours. Small clyses and paregoric were administered. On the fifth day, the temperature was normal and remained so. The sutures were removed on the seventh day, and the patient was discharged the sixteenth day postoperatively with the wound entirely healed, and a weight gain during his stay in the hospital of 14 ounces.

PATHOLOGICAL REPORT

"On section, the testicular tissue is found to be extremely hemorrhagic. The normal anatomy cannot be made out in the gross. The appendix measures 4.5 cm. in length and 6 mm. in diameter at its widest portion. There is moderate injection of the external vessels. On section, the wall is found to be of normal thickness, the lumen is patent and contains homogenous material.

"Sections microscopically through the testicular tissue show a marked acute inflammatory change, characterized by hemorrhage and polymorphonuclear infiltration. The tissue contains numerous, large, dilated blood vessels filled with red cells. The spermatic cord shows a similar microscopic picture. The appendix shows evidence of an acute inflammatory process. The vessels of the serosa are markedly injected with foci of perivascular infiltration. It is accompanied by considerable edema. There is no evidence of any malignant change in the tissue submitted for examination.

"Pathological diagnosis: Acute inflammation of appendix. Acute inflammation of testicle, probably due to torsion." (The possibility of torsion was considered at the time of operation, but there was no evidence of such a condition.)

We have reviewed the literature during the past five years, both American and foreign, and find no cases of this type reported. There have been, however, five cases of appendicitis with strangulated hernia, which have been reported in the foreign literature. In none of these cases has there been involvement of the testicle, and no one of them has been an infant. We are reporting this case, because of the patient's age and the extraordinary complications encountered.

THE MECHANISM OF A SPRAINED ANKLE

BY ALEXANDER P. AITKEN, M.D.*

ALTHOUGH there is nothing more common than a sprained ankle, little can be found in the textbooks to explain what structures are involved and what actually takes place when an ankle is sprained. The structures which are said to be most commonly involved are the deltoid ligament, the anterior and lateral bundles of the talo-fibular ligament and the calcaneo-fibular ligament. Our experience leads us to believe that it is only in the exceptional case that these structures are involved. We find, as others have already pointed out, that in the great majority of cases, the point of maximum tenderness lies just medial to the external malleolus. This point corresponds to the distal tibio-fibular joint and lies directly over the anterior ligament of the external malleolus (anterior tibio-fibular ligament). We believe that this is the structure most commonly injured in sprains of the ankle. (Figs. 1 & 2.)

The manner in which this injury occurs is as

*Aitken, Alexander P. — Assistant in Surgery, Boston City Hospital. For record and address of author see "This Week's Issue," page 871.

follows: The ankle joint consists of a relatively square mortise made up by the tibia and fibula, and a relatively square tenon, the astragalus. When the foot is held at right angles, the wider anterior portion of the body of the astragalus fills the cavity of the mortise. With the foot in this position any sudden twisting of the foot, especially inversion, will have a tendency to twist the astragalus in the snugly fitting mortise prying it apart. (Fig. 3.) When one takes into consideration that the entire body weight is being exerted on the ankle at the time of the injury, one can appreciate the tremendous leverage thus brought to bear upon the mortise.

FIGURE 1

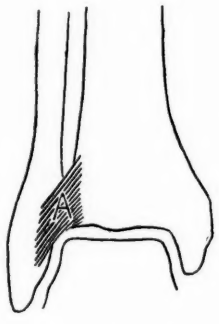


FIGURE 2

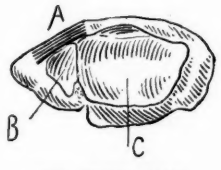
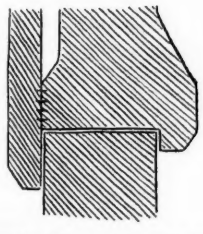


FIGURE 3



A ANTERIOR TIBIO-FIBULAR LIGAMENT
B FIBULA
C TIBIA

Now the mortise is not a complete bony structure. It has one decidedly weak point, namely at the tibio-fibular joint and it is at this point that the mortise tends to give way. Tension is thus placed on those ligaments which bind the fibula to the tibia, the anterior and posterior ligaments of the external malleolus (anterior and posterior tibio-fibular ligaments). As the anterior portion of the mortise is in much closer contact with the wider anterior portion of the body of the astragalus, most of the tension is thus brought to bear on the anterior portion of the tibio-fibular joint. As a result of this tension we get tearing or stretching of the anterior tibio-fibular ligament which accounts for the pain and tenderness just medial to the external malleolus.

We have described this lesion as occurring with the foot being forced into inversion. However, it is perfectly possible for the same picture to appear, should the foot be forcibly everted. However a fracture of the internal malleolus is more common in this type of injury.

The above is of course not the complete picture seen in most sprains. There may be a general stretching of the other ligaments and tendons, which in the latter may amount to a tenosynovitis. There also occurs injury to the overlying soft parts with subcutaneous hemorrhage.

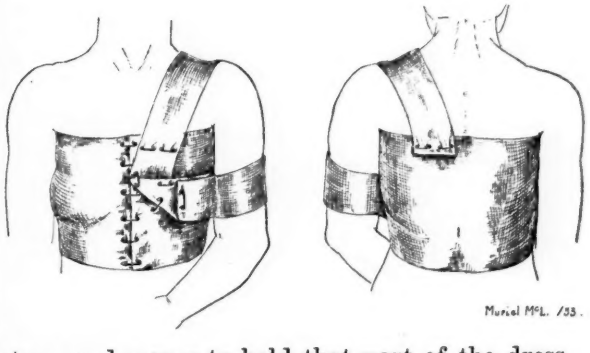
In our series of cases we have found the above picture in well over 80 per cent of the cases.

A COMFORTABLE BREAST SWATHE

BY ERNEST M. DALAND, M.D.*

SEVERAL years ago the late Dr. Frank Richardson suggested to the writer that the breast dressing described below be substituted for the double binder then in use. The inner swathe or binder had been used to hold the breast dressing in place postoperatively and the second binder had been passed around the arm as well as the chest. Patients had been complaining bitterly about the double binder and had often pleaded to have it removed or loosened.

The chest swathe is applied as usual, but care is taken that the swathe used is not too wide and that it does not arch upward in the front or back above a line drawn between the apices of the axillae. This swathe is made of Canton flannel. A second swathe of the same type is then folded lengthwise three times, making its width one third that of the first. It is fastened to the first swathe posteriorly by two pins, brought over the shoulder and pinned to the first swathe in front. This makes a comfortable shoulder strap and serves to hold that part of the dressing over the pectoral region in place. The folded swathe is then brought down to the center of the chest swathe, anchored with one or



*Daland, Ernest M.—Chief of Surgical Out-Patient Department, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 871.

two pins, turned on itself, carried around the arm, back to itself where it is anchored with another pin.

Aside from holding the dressing in place, the purpose of any postoperative breast dressing is to make the patient comfortable. She is uncomfortable if she abducts the arm, but there is no reason why she should not move the forearm, for it does not give pain. Abduction also disturbs the healing of the skin flaps by making a dead space beneath them.

The dressing described acts as a sling for the upper arm and the arm is more comfortable than if a pillow is used to keep it from dropping backward. It allows a slight amount of movement of the arm across the chest and it allows full motion of the forearm. It is used during the first four or five days after operation. When it is removed the patient is ready to start active but limited use of the arm. No passive manipulation is ever used. The patient is never urged to use the arm, nor is it suggested that she is in danger of not regaining full motion. However, the average patient is able to comb her hair by the time she is discharged from the hospital, whether she has had a simple or a radical operation.

THE HEEL SHIFTING OPERATION FOR FLAT FEET,— AND OTHERS

BY FREDERIC JAY COTTON, M.D.‡

LONG, long ago an ingenious German named Gleich devised an operation.

Years afterward, I chanced on his report and promptly adopted the method for a variety of purposes.

The essence of the thing is a shifting of the back end of the os calcis to readjust the relations of the weight-bearing line of the leg and the much discussed "triangle of support" of the plantar foot surface*.

About the same time it was my privilege to work with Dr. Robert Lovett on a bit of investigation and presently we evolved some basic facts and principles† that rather supplanted a lot of the previous work, mainly German.

This changed a lot of ideas as to mechanical physiology of the foot, and cleared our heads very much.

Nevertheless the old idea of sheer *static* weight bearing was sound, and the idea of importance of the relation of the weight-bearing line of the leg to the weight-sustaining triangle of the sole, held true.

Also the ability to shift the rear point of this triangle, the heel, surgically, remained most important.

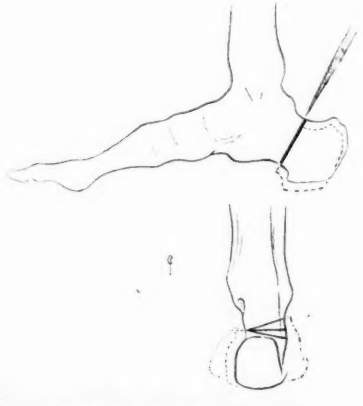
Oddly enough Gleich's idea has never been largely utilized—to my knowledge.

His operation rested on the possibility of shifting the rear end of the os calcis inward, after division of the "neck" of the bone with a Gigli wire saw.

The saw seems unnecessary and less desirable than a clean cut with a thin osteotome which leaves surfaces less burned over and irregular enough to make entanglement or any desired impaction easy and effective.

The approach may be anywhere (easily managed from the outer side) so as to cut down and forward.

With the heel once free one may carry it inward or outward, downward, or down and forward.



MOBILIZATION OF HEEL

Upper figure: Shows the cut across the "neck" of the os calcis. The dotted line shows the heel shifted downward and somewhat forward.

Lower figure: Shows the ankle from behind. The heavy lines show the cuts across the bone varying in direction (in this plane) according to the purpose of the operation.

The heel may be displaced along the line of these cuts to give the various corrections indicated by the various dotted lines.

According to what is desired the slant of the cut may be varied in two planes as the illustrations show. This makes any sort of correction easy, with maintenance of adequate bone contact.

One need not hesitate to do radical shifting of the heel, or to secure the position once gained by producing light impaction with a hammer on the thick weight-bearing pad of the heel.

Maintenance of position is secured with a plaster of Paris boot.

Union, as always where the os calcis is concerned, is amazingly prompt.

*The triangle is formed by the distal heads of the first and fifth metatarsals and the plantar bearing point of the os calcis. The weight-bearing line is down the tibia to the middle of the astragalo-tibial joint.

†Lovett, R. W., and Cotton, F. J.: Some pathological practical points in the structure of the foot. Tr. Am. Orthop. A. 11: 298, 1898.

‡Cotton, Frederic Jay—For record and address of author see "This Week's Issue," page 871.

Weight-bearing may be begun carefully, as early as a month after operation.

Devised for palliation of the extreme flat feet so common in European peasants, the operation first proved itself here in the correction of valgus deformity in old consolidated os calcis fractures, then in certain selected cases of flat foot, and also in varied valgus and varus deformities, notably in the correction of the rather common residual twist inward of the heel seen in club feet otherwise adequately corrected, whether congenital or of paralytic origin.

The operation is very simple.

Its adaptation to the case in hand demands, and rewards, a certain mechanical deftness.

MEDICINAL WHISKY RULING ISSUED BY FEDERAL DRUG OFFICIALS

The Food and Drug Administration recently issued a statement intended to clarify the specific requirements of the Federal Food and Drugs Act as they apply to medicinal whisky. The announcement supplements but does not in any way conflict with the labeling regulations covering beverage whisky recently issued by the Federal Alcohol Control Administration. It shows that whisky sold for drug purposes is subject to requirements which do not apply to an article intended exclusively for beverage use.

The Food and Drug Administration emphasizes that the requirements it enforces in regard to medicinal whisky are not administrative rulings, but are set forth in the Food and Drugs Act which requires that drugs listed in United States Pharmacopoeia shall conform to the definition in that authority. The definition for whisky in the U. S. Pharmacopoeia is more rigid than the definition for "straight whisky" which the FACA issued February 6, 1934, in that Pharmacopoeia whisky must be aged four years in charred wood containers, and its alcoholic content must be not less than 47 per cent and not more than 53 per cent by volume of absolute alcohol. Medicinal whisky which does not conform to the pharmacopoeial standard must be labeled to differentiate it clearly from the official product. The Food and Drug Administration statement includes illustrations of labels which will be regarded as legal on such products.

The statement issued recently applies to medicinal whisky sold in the District of Columbia and to whisky for medicinal use shipped in interstate commerce throughout the United States.

The text of the ruling follows:

A drug sold within the jurisdiction of the Federal Food and Drugs Act as "*Whisky*," "*Spiritus Frumenti*," or "*Sp. Frum.*" must comply exactly with the definition for "Whisky" in the U. S. Pharmacopoeia and otherwise satisfy the provisions of that authority for "Whisky." It must be labeled with a statement of the quantity of alcohol in terms of the percentage by volume of absolute alcohol.

A drug varying from the Pharmacopoeial specifications for "Whisky" in strength, quality or purity (but not in the identity of its constituents or of the materials from which it is made) may be sold as "Whisky not U.S.P." if the label carries a declaration of its own standard of strength, quality and purity. It may be (1) an article conforming to the definition in the U. S. Pharmacopoeia except with respect to time of aging, percentage of alcohol and content of acids and esters, or (2) a mixture of (1) with grain alcohol or grain alcohol and water, or (3) a mixture of U.S.P. whisky with grain alcohol and water. It may not contain alcohol from non-grain sources nor may it contain any substance not present in U.S.P. whisky. Such a drug may be labeled as in the following three examples, assuming it to be of the indicated composition in each case:

Whisky
Not U.S.P.
Aged —— years
Alcohol by Volume ——%

Whisky
Not U.S.P.
——% straight whisky aged —— years, ——%
neutral spirits from grain
Total Alcohol by Volume ——%

Whisky
Not U.S.P.
——% U.S.P. Whisky ——% neutral spirits
from grain
Total Alcohol by Volume ——%

Diluted alcohol (from whatever source) with or without artificial flavor and color is not entitled to the name "Whisky" however qualified, if sold as a drug; but may be sold as a drug under any other name which is not false or misleading in any particular.

A pharmacist in the District of Columbia filling a prescription for "*Whisky*," "*Spiritus Frumenti*" or "*Sp. Frum.*" must fill it only with whisky conforming to the requirements of the U. S. Pharmacopoeia. If a physician prescribes "Whisky not U.S.P." and specifies the standard of strength, quality or purity desired, the prescription must be filled with a product conforming to such specifications.

This announcement shall not be construed as modifying or changing the regulations of the Federal Alcohol Control Administration relative to the labeling of distilled spirits but shall be considered as an addition thereto.—*Bulletin, U. S. Department of Agriculture.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20161

PRESENTATION OF CASE

An American engineer thirty-three years old entered complaining of vomiting, fainting, and bloody and tarry stools.

For the past ten years the patient had had occasional vague attacks of indigestion consisting principally of gas and a feeling of fullness in his abdomen. Relief was always obtained by the taking of soda or milk of magnesia and lying down for a few minutes. There was no real abdominal pain. These symptoms were not all related to meals and were not relieved by food. During the three months prior to entry this vague abdominal discomfort became more noticeable. Seventeen days before admission he noticed a dull aching pain high up in the epigastrium and in the left hypochondrium which after lasting for fifteen or twenty minutes seemed to "work through to his back", producing a dull pain at about the first lumbar segment in the midline. This pain came on several hours after meals, did not awaken him at night, and was not relieved by food or soda. Two weeks before admission he passed a moderate sized tarry stool. This was not associated with weakness or faintness. One week before admission he became nauseated one evening and vomited about a half a glassful of black material. He felt considerably relieved, but was somewhat weak and dizzy. He felt well the next morning. Four days before admission he had some epigastric pain and passed two tarry stools. On the night before admission he passed another tarry stool, had profuse sweating, became very weak and dizzy, and later vomited about a pint of black material, following which he fainted for a few minutes. He was brought to the Emergency Ward in an ambulance and shortly after arrival vomited half a kidney basinful of brick red blood.

His family and past histories are negative.

Physical examination showed a well nourished man lying on the shock table sweating profusely. The skin and mucous membranes were pale. The heart was not enlarged. The sounds were distant. No murmurs were heard. The blood pressure was 70/55. The lungs were clear. The abdomen was scaphoid. There was a lower right rectus scar. There was slight tenderness in the epigastrium upon pressure. Rectal examination was not done. The knee jerks and ankle jerks were not obtained. Babinski was negative.

The temperature was 100°, the pulse 140. The respirations were 16.

The examination of the urine was negative. The blood showed a red cell count of 2,870,000, a hemoglobin of 50 per cent. The white cell count was 15,800, with 65 per cent polymorphonuclears. The stools showed a four plus guaiac.

The day following admission he was given a blood transfusion of 300 cubic centimeters and 1000 cubic centimeters of ten per cent glucose. The blood pressure remained about 120 systolic throughout that night. The following morning he vomited 500 cubic centimeters of bright red blood, following which his blood pressure dropped to 50 but gradually went back to 85. He was given 200 cubic centimeters of citrated blood and the same amount of ten per cent glucose. A surgical consultant advised frequent transfusions until the blood pressure was well above 100. He also advised that surgery should not be urged until the patient had picked up, which would probably be in about two months. Intravenous glucose and transfusions were continued. On the sixth day a note was made that it was three days since the last hemorrhage and that everything was going well. The pulse had gradually fallen to 80 and the blood pressure had averaged between 110 and 125 systolic. The patient had taken some cracked ice at half hour intervals. The next day he was put on milk and cream, one ounce every two hours. On the sixth day he was given a second stage diet with powders. That evening he passed a large hard black stool. The following day, after another hemorrhage, he was transferred to the Surgical Service and was operated upon.

The day following the operation the temperature was 104°, the pulse 140. He had signs of a slight collapse at the right base and was put in an oxygen tent. X-ray of the chest showed mottled areas of consolidation throughout both lung fields. Physical examination showed coarse râles throughout the chest, with a large patch of bronchial breathing at the right base. He was transfused several times. He continued to cough up about six or seven ounces of foul sputum daily. The wound drained profusely. Postural drainage and neoarsphenamin were continued, but he rapidly went downhill. His temperature ranged between 101.5° and 103°. He died twenty-four days after operation.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES: We did not have a chance to examine his gastro-intestinal tract.

We have the films of the chest here. This is the first film, taken the day his temperature went up or the day after. It shows definite lesions in both lungs, large soft mottled areas

which to me do not suggest massive collapse. I suppose it is possible that they were due to alveolar collapse, but it would be very unusual to have even that type scattered through both lungs. The appearance is much more suggestive of multiple infarcts or of bronchopneumonia. As yet I do not know how to distinguish between early infarct and bronchopneumonia.

In this film, taken nine days later, the process in his lungs has apparently cleared up with the exception of an area on the right side near the angle of the scapula. There is a considerable difference in the exposure time of these two films and soft small areas might easily be blotted out, although I hardly think that is the case. The diaphragm is in the usual position in both sets of films, and the heart is not displaced.

In a film taken a few days later, on the twenty-fourth day,—a softer film, which would certainly show anything that the other showed,—the left lung is practically free from any disease as far as we are able to demonstrate disease by x-ray. On the right side the patch that was previously noted is still present, somewhat larger and more diffuse, and looks like a pneumonia; still it could be an infarct. These were all portable films.

In the film taken just before death we can see that the process is very extensive in both lungs, and of the same general character as before. The film taken of the abdomen shows an unusual amount of density on the right side; nothing else.

From the point of view of x-ray the problem here is to distinguish between multiple infarcts of the lung and pneumonia. We were unable to demonstrate an abscess cavity at any time. If it was a pneumonia it was probably a bronchopneumonia that cleared up; then something else happened. I can make no definite diagnosis.

Further History

The operation was performed under ether and lasted an hour and twenty minutes. It consisted of ligation of the vessels of the lesser curvature, cauterization of the ulcer, and posterior gastro-enterostomy.

Differential Diagnosis

Dr. Donald S. King: I do not think it necessary for me to discuss the part of the story which relates to the gastric ulcer. The operation proved that the patient had an ulcer and I shall leave to the surgeons the discussion as to the optimum time of operation on these cases with profuse hemorrhage. From the medical standpoint the principal problem is that of the pulmonary complication, and we have only a few lines at the end of the case record to throw light on this condition.

In the first place, the operation was performed under intratracheal anesthesia. This adds interest to the case, because the surgeons and anesthetists at the hospital have grown to feel that cases which have received intratracheal anesthesia have very rarely developed pulmonary complications.

Of particular interest in this case is the occurrence of foul sputum. The case record as given to me for study did not mention the occurrence of foul sputum. This fact was left out, I suppose, intentionally. I am interested in knowing if this patient had mouth sepsis, because there is reason to believe that in many cases with pyorrhea and extensive dental caries there is inhalation of this septic material and a resultant spirochetal pneumonia. Such pneumonia has been rare in this hospital, but Dr. Churchill has spoken of cases that he observed at the City Hospital. Personally, I have not observed a case of pure spirochetal pneumonia in this hospital. Was anything said in this patient's hospital record about the condition of his mouth?

Dr. M. J. Bachulus: Examination of his mouth at entry showed dirty carious teeth and retracted reddened gums.

Dr. King: He did have, then, mouth lesions from which material containing spirochetes could be inhaled, but if he did inhale this septic material from the mouth in spite of an intratracheal anesthesia this is an interesting phenomenon.

From a statistical standpoint, the fact that he was given ether anesthesia does not give me any great concern, especially if the ether is given carefully by the intratracheal method.

The day following operation the temperature was 104°, the pulse 140, findings which are not typical of an ordinary collapse, especially since the record notes signs of only slight collapse at the right base. With this temperature we would ordinarily expect a very severe bronchopneumonia of a character which often results fatally.

He was put in an oxygen tent, so that he must have been in a rather serious condition. He would certainly not have been put in the tent for only a slight collapse.

The x-ray, as Dr. Holmes has demonstrated, shows mottled dullness throughout both lung fields. Certainly this is not the picture of collapse.

He had coarse râles throughout both chests and a large patch of bronchial breathing at the right base. These signs might be due to pneumonia or collapse with the bronchus open, but from the general x-ray picture one would say pneumonia.

He coughed up six or seven ounces of frothy sputum daily. This is not characteristic of collapse, pneumonia, or abscess. The fact that he had foul sputum later, however, makes one think definitely of abscess or spirochetal pneumonia.

I have no doubt that Dr. Allen would like to overlook the fact that the surgical wound drained

profusely and to put the responsibility for the patient's death on the medical condition. I am accustomed to that, because I find that at autopsy the surgeon will always attach more importance to a small area of pneumonia than to a large area of peritonitis. Nevertheless in this case I must grant there was enough in the lungs to account for the fatal termination. The patient died twenty-four days after the operation, apparently after a long and stormy course. This is certainly not the story of collapse. It may be bronchopneumonia, but in view of the foul sputum it is not the ordinary bronchopneumonia. I assume that spirochetes were found in the sputum, otherwise he would not have been given neo-arsphenamin.

DR. TRACY B. MALLORY: None were found.

DR. KING: It is interesting if an abscess did really develop in spite of early neo-arsphenamin treatment. Dr. Lord and I have been going over the lung abscess cases which have been treated by neo-arsphenamin, and with the data now at hand we have not been able to find any evidence that such treatment has been of definite value. In this case, at any rate, it did not seem to help.

I had not seen the x-ray films until the present time, but before I had seen them I believed that we were dealing with either a lung condition brought about by septic emboli or a spirochetal pneumonia due to inhalation of septic material from the mouth. We have had, so far as my experience is concerned, very few postoperative pulmonary complications of this sort which were proved at autopsy to be due to embolic processes. I remember well one patient who died two days after operation who had an x-ray film similar to this one, though with less mottling. He died with all the symptoms of pneumonia and none of the characteristic symptoms of pulmonary emboli or infarct. The autopsy showed multiple septic emboli apparently arising from a phlebitis in the leg; so that if there were a definite source for septic emboli in this case, the whole picture might be explained on this basis. With the facts at hand, however, it seems to me more reasonable to call this a spirochetal pneumonia rather than an embolic pneumonia or a true lung abscess. Certainly no large lung abscess has been demonstrated, and the process was so diffuse throughout the lung that my diagnosis would be a spirochetal bronchopneumonia with possible abscess formation.

CLINICAL DISCUSSION

DR. ARTHUR W. ALLEN: This patient was thirty-three years of age. He had had indigestion for a period of several years and acute stomach symptoms for nearly three weeks before he came in here. The commonest source of profuse hemorrhage from the upper gastro-intestinal tract in a patient of this age is duodenal ulcer. It outweighs all the other causes tremendously.

We have had in this hospital one hundred and thirty-nine cases of massive hemorrhage from duodenal ulcer in the past twenty years. Twenty of these have died of hemorrhage. I am sorry to say that I do not know how many cases of fatal hemorrhage we have had from other causes, but I believe the number will prove to be very much smaller than from duodenal ulcer hemorrhage. We have had one death that we know about from a polyp of the stomach. We have had one death from hemorrhage in a profuse gastritis. Dr. Means called our attention at one of these meetings not long ago to one death from hemorrhage in carcinoma of the stomach. We have had one fatal hemorrhage from a gastrojejunal ulcer. Gastrojejunal ulcers are apt to bleed, but not in such amounts as this one did.

We assumed that this man had a posterior wall duodenal ulcer with an erosion of a vessel overlying the pancreas. We have found that in the deaths that occurred under fifty years of age the mortality was 4.4 per cent; over fifty years of age the mortality was 33 1/3 per cent. I do not believe that patients of this type can be successfully operated on in a depleted state with a mortality as low as 4.4 per cent. I think that they probably can be operated upon with a mortality lower than 33 1/3 per cent. So given a patient under fifty with a posterior wall duodenal ulcer with massive hemorrhage, I think we should give him the benefit of the doubt and allow him to recover under a medical régime. If he were in reasonably good condition and fifty, or a little over, or nearly fifty, I think we should be inclined to operate on him as soon as he recovered from shock, providing the medical men would permit it.

This man had an unusual lesion to produce a massive hemorrhage. He had a large ulcer of the upper posterior wall of the stomach which had eroded the main vessel along the lesser curvature. In retrospect possibly we might have suspected that the lesion was not a duodenal ulcer, because the course was not like that of a duodenal ulcer. At his age he should have stopped bleeding and not have bled again so profusely, so quickly. However, we waited a week or a little longer, and finally after this last profuse hemorrhage we felt that he was certainly doomed to bleed to death and that we had no right to wait longer, so as a last resort we did a big operation on a man who was in an extremely depleted condition.

We wanted to protect the patient as best we could and gave intratracheal anesthesia, a total of two ounces of ether during the operation. The other chart is here. It is interesting that he had no fall in blood pressure at all during the operation, which went along very smoothly. On

opening the abdomen we found an enormously dilated stomach. It was perfectly obvious that the duodenal region was free, there being no induration in that region such as we always get when we are dealing with a duodenal ulcer. The stomach revealed induration not far from the cardia in a very inaccessible area. It could not be approached with any other method than by opening the anterior wall of the stomach. This was done. A clot which was in reality a cast of this huge stomach—this cast probably weighed five pounds—was removed first and then the ulcer was exposed. It was about 3 centimeters in diameter, and on its anterior border was a thrombosed vessel. As soon as this was manipulated the thrombus came away with a tremendous gush of blood from the vessel. The vessel was two or three millimeters in diameter, so that having it exposed it was possible to ligate the vessel on the outside and stop the bleeding. It was not possible to cauterize the base of the ulcer successfully, although that was attempted. Having stopped the hemorrhage, the anterior wall of the stomach was closed and a posterior gastro-enterostomy done, because for some reason or other his pylorus though patent did not function properly. It is a well known fact that often in gastric ulcer the physiology of the pylorus is abnormal.

The wound became septic and the discharge had a very foul odor. As one came into this man's room one remembered cases of abscess of the lung one had seen. The odor was terrific. The pus in the abdominal wall smelt the same as that in the sputum and I believe proved bacteriologically to be the same. The abdominal wall sepsis responded to conservative measures and did not, we think, play any marked rôle in this man's exitus.

Dr. Frederick T. Lord: With respect to the diagnosis of the postoperative disturbance, the odor of the breath suggested pulmonary abscess. There was a different odor from the abdominal wound as compared with that from the breath. As far as the pulmonary condition is concerned, the clinical aspects were consistent with a pulmonary abscess.

Dr. King has spoken of our experience in reviewing cases of pulmonary abscess. This was an important experience with respect to the ineffectiveness of neoarsphenamin in an early treated patient. In addition to what Dr. King has said, on two occasions we have noted the extension of a pulmonary abscess under treatment with neoarsphenamin. While we are not able to settle the question of the merits of neoarsphenamin, our experience here does not suggest that it has merit.

With respect to the problem of surgical interference in patients with bleeding peptic ulcer, resulting shock and profound anemia, this is my second recent experience. The first patient, discussed last July (Case 19302, *N. E. J. of Med.* Vol. 209, No. 4, July, 1933) died in consequence of a postoperative subdiaphragmatic abscess and this patient succumbed to postoperative complications. Of the 138 cases in Allen's series with acute massive hemorrhage, only 20 died. Of these 20 fatal cases, 12 bled to death without operative interference and 8 succumbed after operation. Complete failure of operation may be ascribed to intervention when the patient was in a depleted state. It is difficult to watch patients hovering between life and death from hemorrhage without finally resorting to surgical measures of relief, but it must be appreciated that the majority of such patients recover spontaneously and that such a major operation as is proposed is of itself hazardous from superadded surgical shock and postoperative complications. Almost certain operative failure after depletion from rapidly repeated hemorrhage naturally raises the question of earlier intervention. The difficulty here is to determine in advance whether the patient will spontaneously recover or die. I am impressed with Allen's figures of the low mortality in patients under and the high mortality in those over fifty years of age, and I should like to ask on how many cases in these age groups the figures are based. Though the chance of spontaneous recovery is much less in the older age group, I do not believe it is possible to predict whether or not spontaneous recovery will take place in the individual case. The attempt at selection is likely to lead to surgical intervention in certain patients who would recover without it. In view of the danger of an operation of such magnitude during an episode of severe bleeding, early interference is, I think, more likely to raise than to lower the mortality.

Dr. Allen: There were forty-eight of these cases over fifty years of age with sixteen deaths, and ninety-one cases under fifty with four deaths. Perhaps these statistics are not important, but the fact remains that under fifty the chance of recovery is so great that we should treat them expectantly. If we could decide before these patients become so depleted that they are likely to fall into the mortality group, and operate on them as soon as they have recovered from shock and before they have become starved, a great many of them ought to be operated upon successfully. As a matter of fact we have radically operated upon them in a subacute stage quite successfully so far, twenty consecutive cases without mortality. I am perfectly sure however that the operative mortality after two or three weeks of hemorrhage and starvation must be very high, and that is I think the differential point. We must either operate early, before the patients are depleted, having made up our minds that they will fall into the high mortality group, or hold out until they have recovered from the main effects of hemorrhagic depletion.

Dr. Holmes: May I ask Dr. Allen whether in case he had had information as to where the

ulcer was it would have made any difference?

DR. ALLEN: If we had known it was a gastric and not a duodenal ulcer we should have operated just as soon as he had recovered from shock. I have a feeling that probably his severe postoperative pulmonary and wound infection would not have occurred if we could have operated upon him before he was actually starved to a level of no resistance. He was depleted by starvation as well as by bleeding.

DR. EDWARD D. CHURCHILL: In relation to pneumonia, there is a term that comes to my mind in a picture like this, the so-called "aspiration pneumonia." It may also follow immersion, particularly in sewage contaminated waters. I shall expect to find multiple foci of pneumonitis with small abscesses, probably in the right lung a fairly good-sized one. I think the infection probably came from his mouth. The patient was vomiting and had been on restricted fluids by mouth before the operation. I am not certain that a film taken before the operation might not have shown this pneumonia. I think that when patients are kept on nothing by mouth for days the utmost care should be taken in oral hygiene, particularly if they are to face a surgical operation eventually.

DR. CHESTER M. JONES: I have about the same feeling that Dr. Allen has, that some of these patients must come inevitably to surgery, and any precautions we can take to insure better preoperative care should be taken. We have to accept the mortality in some of these cases rather than let them go. In this case I should say operation presented an unusually serious risk because of the age of the patient, and decision as to when to do it was harder here than in many cases we have had in the hospital.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Bleeding gastric ulcer.
Lung abscesses.
Bronchopneumonia.

ANATOMIC DIAGNOSES

Operative wound, posterior gastro-enterostomy, cauterization of ulcer of lesser curvature of stomach.
Localized peritonitis.
Multiple miliary pulmonary abscesses.
Chronic fibrous pleuritis.
Operative wound, old: appendectomy.

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy on this man showed of course the remnants of the ulcer, which was on the posterior wall of the stomach very close to the lesser curvature, partly involved the lesser curvature and had eroded a large vessel, as Dr. Allen has told you. The floor of the ulcer was formed by the liver and pancreas, into both of which it had burrowed fairly deeply. It would obviously be impossible to attempt resection of such an ulcer.

The peritoneal condition from which drainage persisted over such a long period proved to be a well localized peritonitis immediately under the postoperative wound and backed by the stomach and a portion of the liver. The greater part of the abdominal cavity was perfectly clean; I think it is quite fair to say that that had no significant part in causing his death.

The lungs showed a very uniform diffuse process consisting of multiple small abscesses not one of which was over half a centimeter in diameter. Microscopically these showed areas of increased leukocytic reaction.

No organisms except some very minute cocci could be made out, and no spirochetes were found, although a special spirochete stain has not been done.

The other organs were all essentially negative.

The picture, as Dr. Churchill suggested, is almost identical with that of what we call aspiration pneumonia. I have seen the same picture a number of times when there has been a definite history of vomiting during the later stages of anesthesia, and unquestionably inhalation does cause it. We have no such history here, unless the inhalation occurred before operation, which I think is very possible.

DR. HOLMES: There is one point which is difficult to explain, that is the disappearance of the process from the left lung after it had started, as far as I can tell by x-ray.

DR. MALLORY: Yes; there was no apparent difference in the type of the process or the age of the process on the two sides. The abscesses were in the terminal bronchioles and immediately adjacent alveoli, distributed by the bronchial tree and not by the blood vessels.

DR. HOLMES: Instead of saying that the x-rays were at fault, I said that he had had a disease from which he recovered, and the terminal picture was superimposed upon the early process. That would hardly be possible?

DR. MALLORY: I think it is possible that the process could have cleared up to some extent during a temporary period.

DR. JONES: That would fit into the clinical picture certainly.

DR. HOLMES: May I add that there is rather more fear of the barium meal in bleeding cases than is necessary. In such a case as this, barium could have been given and the ulcer located without danger to the patient.

CASE 20162

PRESENTATION OF CASE

An American clerk forty-eight years old was admitted from a State prison for the repair of a ventral hernia.

Five years before entry he had an appendectomy, followed four months later by bulging of the lower end of the scar. Three years before entry he was told during a life insurance examination that he had bilateral inguinal hernia, although he had never noticed any swelling before.

His father died of heart failure at the age of seventy-four. His mother, who was seventy-four years old, was living, but in poor health. Two sisters were living and well. There was no history of tuberculosis or cancer.

He had been married for twenty-four years. His wife and four children were living and well. One child died following appendicitis. There had been one stillbirth.

He had been well most of his life. There was no history of scarlet fever, rheumatic fever, pneumonia or influenza. He was said to have had a traumatic pleurisy four years before admission, at which time two ribs were broken. Two years before entry he lost about twenty-five pounds. but had gained forty-five pounds since that time. Recently he had lost about ten pounds.

Physical examination showed a healthy appearing, well nourished man. The upper teeth were false. There was some pyorrhea. The abdomen was pendulous. There was marked protrusion in the right lower quadrant. Just to the right of the umbilicus was a scar at the distal end of which was a small easily reducible hernia. There was a small soft easily reducible right inguinal mass protruding down the inguinal canal and descending to two centimeters above the pubic spine.

The temperature was 98°, the pulse 80, the respiration 20.

Examination of the urine was negative. A Hinton test was negative. The non-protein nitrogen was 27. A preoperative white cell count was 12,300.

Three days after admission a ventral and a right direct inguinal hernia was repaired under gas and ether anesthesia. Two days after operation the patient developed what was called collapse at the right base. One week after operation his temperature was 101°. The signs in the right chest were still present and appeared more marked. There was dullness with diminished tubular breath sounds and voice sounds. A chest film on the sixteenth day showed in the right base a small triangular shadow of increased density with its apex directed toward the heart. There was slight displacement of the heart and mediastinum to the right. The supracardiac shadow was also increased to the right. His temperature remained elevated, ranging from 100° to 102°. He began to complain of sharp pains in the right chest anteriorly on deep inspiration, and also produced a fair amount of sputum. On the twenty-seventh day a note was made that the chest pain had disappeared. His temperature still fluctuated up to 102°. He sweat profusely and brought up large amounts of purulent sputum. There was questionable early grooving of the nails.

X-ray examination of the chest at this time in the lateral view showed the dullness to lie in the midportion of the chest. It appeared to involve the anterior portion of the lower lobe and a portion of the middle lobe. The septum between the middle and upper lobes appeared to be displaced downward. No fluid levels were demonstrated.

Examination of the sputum showed Gram-positive and negative organisms and a rare spirochete. The sputum was thick, yellowish and definitely purulent. The amount varied between one and two ounces.

On the thirty-third day a diagnostic chest tap was performed with the removal of 50 cubic centimeters of greenish cloudy fluid with a specific gravity of 1.030. The cell count showed 2000 white blood cells and 200 red blood cells. A culture showed pneumococci (?) No bile solubility test was done. Two days later a trocar thoracotomy was performed with removal of similar fluid. Culture at this time showed non-hemolytic anaerobic streptococci. His temperature ranged in the neighborhood of 103°. He did poorly.

On the forty-eighth day incision and drainage of a chest wall abscess was performed. Thick foul pus was found overlying the rib in the posterior axillary line. An anterior extension of the incision was then made and a large phlegmon of the chest wall lying deep to the muscles was drained. There was no evidence of perforation of the pleura. The wound of the trocar thoracotomy was then explored and found to be undermined, although by making a lateral incision better drainage was obtained there.

A white blood cell count at this time showed 42,000 cells. The red blood cell count was 5,100,000, with a hemoglobin of 70 per cent. He continued to do poorly. During the next month he received four transfusions. In the early part of the third month he developed edema of his legs. The serum proteins however were 6.7 per cent. The non-protein nitrogen was 37, the chlorides 575, and the carbon dioxide combining power 50.1 volumes per cent. His temperature continued to swing between 101° and 102°. On the ninety-second day lipiodol was injected into the apparent empyema cavity. A chest film showed partial collapse of the upper and middle lobes and complete collapse of the lower lobe. After the lipiodol injection a large cavity was visible just above the diaphragm extending to the right border of the heart from the axillary border and showing a definite fluid level. He continued to receive transfusions, but remained feb-

rile, gradually failed, and died approximately sixteen weeks after admission.

Clinical Discussion

Dr. George W. Holmes: These are the earlier films. They show a process in the right lower lobe which is certainly not characteristic of collapse, although apparently that is what it was thought to be at the time. There is some elevation of the diaphragm; no displacement of the heart.

In the lateral view the process seems to be in the middle lobe. We can have collapse of the middle lobe without much displacement, but the appearance here is more like consolidation. You must remember that we attempt always to take the films at full inspiration, and with pneumonia on one side the diaphragm is always going to be higher on the side where the process is, because that lung does not fill; so that elevation of the diaphragm does not necessarily mean collapse. If this film had been taken at expiration there would not be that difference.

This film I presume was taken at the time the trocar thoracotomy was done. You can see the position of the partially collapsed lung and the fluid along the axillary border. A little later the border of the collapsed lung is better seen. The area of consolidation is still present. There is an area of rarefaction along the axillary border. The extreme base is quite dull, and there is mottled dullness extending upward into the partially collapsed lung.

This film was taken on the same day as the one that I have just shown you. The process is still confined to the right lung.

Dr. Frederick T. Lord: There is very little for me to add. In the Thoracic Clinic we made a diagnosis of lung suppuration with empyema. He probably had a peripheral abscess draining into the pleural cavity. We have had a number of instances of the relief of pulmonary abscess by drainage of empyema.

Dr. Donald S. King: I only wish to say that abscess is the unusual type of postoperative complication. The percentage is low.

Dr. Chester M. Jones: I was asked to say why he had edema, and it seemed to me quite clear that it was associated with long continued sepsis. Whether the edema was actually due to undernutrition incident to the sepsis and therefore a starvation edema complicated by prolonged sepsis and subsequent loss of protein, or due to amyloid changes resulting from chronic sepsis, I was unable to determine. The former explanation is the more likely.

Dr. Edward D. Churchill: The chronicity of the disease in these two cases is interesting—four months' duration in one, twenty-nine days in the other. The organisms that seemed to be the underlying cause in both cases work very slowly and relentlessly. We see them in action externally from time to time in human bite infections of the hand. They are particularly fatal and unyielding when the lung and chest wall are invaded.

Dr. Tracy B. Mallory: Does not the usual case of this type if it lasts as long as this result in a pretty obvious, well-defined abscess?

Dr. Churchill: If it stays within the lung. This type of infection usually extends to the pleura.

Clinical Diagnoses

Right inguinal, umbilical and ventral herniae.
Chronic empyema.
Lung abscess.

Anatomic Diagnoses

Pulmonary tuberculosis, acute, right.
Tuberculous pneumonia, right.
Empyema, right.
Subacute glomerular nephritis.
Miliary tuberculosis of the liver and spleen.
Pulmonary tuberculosis, healed, left.
Pulmonary edema, left.
Pleuritis, chronic fibrous, right.
Arteriosclerosis, slight, aortic and coronary.
Cholelithiasis.

Pathologic Discussion

Dr. Mallory: The autopsy on this man presented a surprise. There was of course an empyema and a small abscess cavity which drained into it, but I do not believe that was the cause of his death. He died of a diffuse tuberculous pneumonia. In the four months he was in the hospital, so far as I can make out from the record, no examination was made for acid-fast bacilli. The process was a very atypical one and was not recognized in gross at the time of autopsy, but, when the slides came through, the liver was found to be peppered with miliary tubercles, and acid-fast stains in the lung show plenty of the organisms.

In connection with his edema, undoubtedly the low serum albumin had a great deal to do with it, but he did have a well-marked nephritis, a glomerulonephritis in spite of the lack of rise in the non-protein nitrogen.

Dr. Jones: Did he have any amyloid deposits?

Dr. Mallory: No.

Dr. Churchill: Were the lungs studded with miliary tubercles?

Dr. Mallory: The lesions in the lungs are quite large. Here is one of them, a big area of caseation with central necrosis. In gross they were all of them mistaken for abscesses, but as one gets out to the periphery of each lesion one begins to find small tubercles. There were large areas of typical caseous pneumonia. One focus of old tuberculosis, evidently long antedating the present infection, was found. Miliary tubercles were present not only in the liver but also in the spleen, and a few scattered ones in the kidney.

The New England
Journal of Medicine
SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL
Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS
R. I. Lee, M.D., *Chairman* — Homer Gage, M.D.
R. B. Osgood, M.D. — R. M. Smith, M.D.
F. H. Lahey, M.D.

EDITORIAL STAFF
Reid Hunt, M.D. — Stephen Rushmore, M.D.
John P. Sutherland, M.D. — Hans Zinsser, M.D.
George R. Minot, M.D. — Benjamin White, Ph.D.
Frank H. Lahey, M.D. — Henry R. Viets, M.D.
Shields Warren, M.D. — Robert N. Nye, M.D.
George L. Tobey, Jr., M.D. — Robert M. Green, M.D.
C. Guy Lane, M.D. — Charles C. Lund, M.D.
William A. Rogers, M.D.

Walter P. Bowers, M.D., *Managing Editor*

ASSOCIATE EDITORS
George G. Smith, M.D. — William B. Breed, M.D.
Joseph Garland, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE
D. E. Sullivan, M.D.* — Benjamin P. Burpee, M.D.
Lawrence Hazzard, M.D.
*Deceased.

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE
William G. Ricker, M.D. — C. F. Dalton, M.D.
E. A. Stanley, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

A CHALLENGE TO THE MEDICAL PROFESSION

DURING recent years much attention has been given to the possibilities of the practice of preventive medicine in the office of the family physician. Opinion both within and without the medical profession has been unanimous in the belief that this should be developed as extensively as possible, differences of opinion arising only as to the degree to which privately and publicly supported clinics should supplement this service. Timely in this connection is the letter recently sent by the Department of Public Health to all physicians in the State, emphasizing the opportunities that are theirs for the further use of diphtheria immunization in their private practice. Particularly significant in this letter is the statement that were immunization made a routine part of the care of the infant "there would be little need for the continuance of public clinics".

This statement may well be accepted as a direct challenge to the medical profession. Statistics of the public immunization clinics show that the majority of the children thus treated are already of school age. Were diphtheria of concern only to the school child, this might be sound practice. When it is remembered, however, that two-thirds of the diphtheria deaths occur in children of preschool age it is readily apparent that the bulk of the publicly supported immunization work is merely to compensate for the omissions of private practice. The family physician has had five years during which he might have immunized the child, and yet in too many instances he has not availed himself of this opportunity. No health department is anxious to carry on immunization work, but, to protect the children of the community, must provide for this if so high a proportion of children are not reached by the family physicians. The extent of the clinic patronage is largely, therefore, a problem which rests in the hands of the medical profession.

Likewise of significance is the tabulation that accompanied the letter showing the prevalence of diphtheria in the larger communities. The city of Lowell, and more particularly the board of health and the physicians, can take no pride in its unenviable distinction of having the highest diphtheria rate in the state. When it is remembered that this is but a repetition of the same unenviable record in 1932 when Lowell was in this respect supreme in New England and a close contender for these questionable laurels on a nation-wide basis, it is evident that it behooves the authorities to do more than condone the situation. This problem may well merit the best attention of the Lowell medical profession. It is to be hoped also that Lowell's chief rivals, New Bedford, Medford, and Somerville, will similarly accept the challenge which these figures convey. In Weymouth it was met too late in the year to affect the figures, but was met by such coöperation between the physicians and the school as to leave no question as to the result. It may well behoove the other communities to do likewise, remembering always, however, that this is but a poor substitute for immunization carried on by the family physician as a part of the routine care of the first year of life.

IODINE AS AN ANTISEPTIC

DURING the past five or ten years, so many claims have been made by the manufacturers of antiseptic solutions that the physician is at a loss to know what to use in his own practice and what is best to advise for use in the homes of his patients. The relative value of such solutions must be based, primarily, on their ability

to kill bacteria, but other factors should be considered, such as penetration, effectiveness in the presence of body fluids (blood, serum, sputum, vaginal secretion, and so forth) and toxicity, both for the body as a whole and for the individual tissue cells. Many articles have appeared in recent medical literature which stress the bactericidal value of the newer antiseptics and, to a less extent, take the other factors into account. Considering only the bacteria killing power, is the solution which is effective in the highest dilution necessarily the one of choice?

In attempting to solve the problem a rating based on the effective dilutions of *usable* solutions has, apparently, been entirely disregarded. Curiously enough, this point has been brought out in the advertisement of one of the commercial houses[1]. For example, an antiseptic which kills bacteria in a dilution of 1:100,000, but which is ordinarily recommended for use in a dilution of 1:500, has only one-tenth the effective or practical bactericidal power of an antiseptic which kills in a dilution of only 1:2000, but which may be used undiluted.

If one applies this correction to figures given in the literature, the results are surprising. For example, against six different bacteria the average dilution which will kill in ten minutes but not in five, as determined by Birkhaug[2], is 1:60000 for metaphen, 1:11000 for hexylresorcinol, 1:13000 for mercuric chloride, 1:3500 for tincture of iodine and 1:240 for merbromin. But, if usable solutions are taken as 1:500, 1:1000, 1:1000, undiluted and 1:50, respectively, the effective usable dilutions become 1:120 for metaphen, 1:11 for hexylresorcinol, 1:13 for mercuric chloride, 1:3500 for tincture of iodine and 1:5 for merbromin. In other words, measured in terms of solutions as applied to the human body, tincture of iodine appears to be about 30 times as bactericidal as the strongest of the other antiseptic solutions referred to above and 700 times as effective as the weakest.

The efficiency of iodine as a bactericidal agent should not be disregarded. It seems likely that some of its disadvantages might be eliminated. Simple dilution of Tincture of Iodine, U.S.P., with alcohol would undoubtedly lessen the chance of iodine burns and still furnish a relatively effective antiseptic. In aqueous solutions, such as Lugol's solution (Liquor Iodi Compositus, U.S.P.), the iodine is just as potent as a bactericidal agent as in alcoholic solution, but the "smarting" effect in open wounds and the incompatibility with body fluids and living cells is diminished, due to the absence of alcohol. It would appear that modifications of this sort deserve more attention.

REFERENCES

1 "Zonite" advertisement. Time. 23:1 (March 5), 1934.
2 Birkhaug, K. E.: J. A. M. A. 95:917 (Oct. 27), 1930.

THE RECORDS OF MATERNAL DEATHS

For many years there have appeared in medical literature statistics relating to the mortality of pregnancy and parturition which have been interpreted as a reflection on conditions in the United States as compared with those of other countries.

This subject is dealt with in the paper by Dr. Brackett appearing on page 845 of this issue, and the author clearly shows that he believes that an unreasonable number of deaths in this medical field are due to faulty methods employed in dealing with the morbidity of pregnancy in the first instance and secondly in the management of childbirth.

Although writers have, on occasion, tried to prove that official statistics do not show comparative conditions fairly because of different classifications of causes of maternal deaths, the records quoted by the author constitute a challenge to the medical profession because he finds in his own experience, and the testimony of others, that the teaching of obstetrics is not always adequate in this country, and that too many practitioners have neither the knowledge of the technic nor appreciation of the art of obstetrical practice.

It is strange that since this appears to be true, that more influence has not been exerted to make medical teaching adequate, and also to have a complete analysis made of the cause of each maternal death. It would certainly be worth while to know whether a given death is unavoidable or whether some one is blameworthy.

Would it not add to the prestige of the profession if medical societies in each state would take on this responsibility of a continuing survey in this field until it can be shown that practitioners are not at fault in any large measure?

THE RECENT SURVEY OF BOSTON'S HEALTH DEPARTMENT

The Survey Committee appointed by His Honor the Mayor to study the Health Department of the City of Boston and to recommend possible curtailments of expenditure has reported. Its recommendations were given to the press, but were not, we believe, published in full.

We feel that the recommendations are of such importance that members of the medical profession will wish to be fully informed and will desire to discuss the matter with laymen who are interested in the administrative problems of Boston. Accordingly, the twelve recommendations of the Survey Committee are presented on page 871 of this issue.

The question is not *whether* the budget of the Health Department is to be reduced, but *how* and *where* the reductions are to be made. It is of the utmost importance that Health De-

partment budget curtailments should be well planned and wisely executed.

Having no official information about what is contemplated for the Health Department, we can only hope that those in authority are giving to the Report of the Survey Committee the serious attention which it merits.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

GREENOUGH, ROBERT B. A.B., M.D. Harvard University Medical School 1896. F.A.C.S. Consulting Surgeon, Massachusetts General Hospital and Collis P. Huntington Memorial Hospital, Boston, Massachusetts. Address: 8 Marlboro Street, Boston, Massachusetts. Associated with him is

TAYLOR, GRANTLEY W. A.B., M.D. Harvard University Medical School 1922. F.A.C.S. Assistant Surgeon to Out-Patients, Massachusetts General Hospital. Surgeon to Out-Patients, Collis P. Huntington Memorial Hospital, Boston. Assistant Surgeon, Pondville Hospital, Norfolk. Address: 264 Beacon Street, Boston, Massachusetts. Their subject is "Cancer of the Breast: End-Results Massachusetts General Hospital 1921, 1922, 1923." Page 831.

SIMMONS, CHANNING C. M.D. Harvard University Medical School 1899. F.A.C.S. Visiting Surgeon, Massachusetts General Hospital. Acting Surgeon-in-Chief, Collis P. Huntington Memorial Hospital. Address: 205 Beacon Street, Boston, Massachusetts. Associated with him is

TAYLOR, GRANTLEY W. His record appears above as a co-author with Dr. Greenough. And

WALLACE, RICHARD H. A.B., M.D. Harvard University Medical School 1927. Assistant in Surgery, Massachusetts General Hospital, Harvard Medical School, and Pondville Hospital. Their subject is "Cancer of the Breast: End-Results Massachusetts General Hospital 1924, 1925, 1926." Page 836.

BRACKETT, EDWARD S. A.B., M.D. Yale University School of Medicine 1902. F.A.C.S. Chief of Staff, Providence Lying-in Hospital. Chief of Staff, Gynecology Department, Rhode Island Hospital. Consultant in Obstetrics, Pawtucket Memorial Hospital. Consultant in Gynecology, Miriam Hospital and South County Hospital. His subject is "Observations on the Problem of Maternal Mortality." Page 845. Address: 167 Angell Street, Providence, Rhode Island.

BRACKENBURY, SIR HENRY B. M.D., M.R.C.S., L.R.C.P. (Lond.), Hon. LL.D. (Wales), Chairman of Council British Medical Association; Chairman of Council Institute of Medical Psychology, London; Vice-President of the Central Association for Mental Welfare, London; Past President of the Association of Education Committees of England and Wales; Ex-Mayor and Freeman of the Borough of Hornsey and Freeman of the City of London. His subject is "Health Insurance in England." Page 851. Address: 30 W. Heath Drive, Solders Green, London N. W. 11, England.

HUDSON, HENRY W., JR. M.D. Harvard University Medical School 1925. F.A.C.S. Assistant Surgeon, Boston Children's Hospital. Assistant in Surgery, Harvard Medical School. Surgeon, New England Home for Little Wanderers. His subject is "Snapping Thumb in Childhood. Report of Eight Cases." Page 854. Address: 66 Commonwealth Avenue, Boston, Massachusetts.

GOLDEN, J. L. M.D. Tufts College Medical School 1928. Assistant Surgeon, Malden Hospital, Malden. Junior Surgeon, Lawrence Memorial Hospital, Medford. Address: 86 Forest Street, Medford, Massachusetts. Associated with him is

HAMILTON, H. H. M.D. Harvard University Medical School 1930. Resident Surgeon, Malden Hospital, Malden, Massachusetts. Address: Malden Hospital, Malden, Massachusetts. Their subject is "Strangulated Inguinal Hernia, with Unusual Complications, in an Infant of Five Weeks." Page 857.

AITKEN, ALEXANDER P. M.D. Tufts College Medical School 1928. Instructor of Surgery, Boston University Medical School. Assistant in Surgery, Boston City Hospital. Junior Surgeon, Chelsea Memorial Hospital. His subject is "The Mechanism of a Sprained Ankle." Page 858. Address: 520 Commonwealth Avenue, Boston, Massachusetts.

DALAND, ERNEST M. A.B., M.D. Harvard University Medical School 1918. F.A.C.S. Chief of Visiting Staff, Pondville Hospital. Chief of Surgical Out-Patient Department, Massachusetts General Hospital. Instructor in Surgery, Harvard Medical School. His subject is "A Comfortable Breast Swathe." Page 859. Address: 483 Beacon Street, Boston, Massachusetts.

COTTON, FREDERIC JAY. See page 817, issue of April 12, for record of author. His subject is "The Heel Shifting Operation for Flat Feet, and Others." Page 860.

MISCELLANY

RECOMMENDATIONS OF THE COMMITTEE APPOINTED BY THE MAYOR OF BOSTON TO SURVEY THE HEALTH DEPARTMENT—MARCH 24, 1934*

The various reductions in the budget items which we have indicated can only be secured by a reorganization of the Health Department, with consolidation of divisions, and curtailment of certain activities. In order to secure a more effective, closely

*From a copy sent by His Honor the Mayor to the Boston Health League.

knit, well-coördinated organization, we wish to make the following recommendations:

ADMINISTRATION

We Recommend:

1. That an official Public Health Council of five persons familiar with public health functions and public health administrative methods be selected by the Mayor. These persons should serve without compensation for a term of five years, with overlapping terms of office. They should hold monthly meetings and should advise the Health Commissioner on the policies of the Department, the appointment of personnel, and should pass on the annual budget.

We Recommend:

2. That the Health Department should be reorganized into six major divisions, as follows:

A. *Administration*, including Accounts, Vital Statistics and Health Education.
B. *Communicable Disease.*
C. *Child Hygiene.*
D. *Sanitation.*
E. *Public Health Nursing.*
F. *Laboratories.*

The Commissioner should be administrative officer for all the departments and responsible to the Mayor for the effectiveness of his work. He should have direct charge of the *Division of Administration.* There should be but one Deputy Commissioner; all other titles of Deputy Commissioner should be abolished. The Deputy Commissioner may well have direct responsibility for administration of the Health Centers and also the *Division of Child Hygiene.*

There should be one director for each of the major divisions that we have listed above. Each director should be responsible to the Commissioner for the activities of his division. Each divisional director should be thoroughly qualified to carry out the functions assigned to him and should devote his *full time* to the work of the Health Department.

MEDICAL DIVISION

We Recommend:

3. That the term "Medical Division" be changed, and the division be called the "Division of Communicable Disease Control."

The present functions and activities of the *Division of Tuberculosis* should be merged with this division.

One-half the cost of the medical inspectors that are assigned to the Health Centers should be charged to this division.

We Recommend:

4. That the Detention Hospital be closed. It is an unnecessary expense and serves no practical purpose. All necessary hospitalization of contagious disease should be assigned to the contagious disease wards of the Boston City Hospital.

CHILD HYGIENE

We Recommend:

5. That the Health Centers be strengthened and supported, for they represent real health protection and promotion to the citizens of Boston. These eight Health Centers are the very life of the Health Department and are Boston's greatest contribution to public health administration in the United States.

SANITATION

We Recommend:

6. That all functions relating to sanitation should be fused in a single *Division of Sanitation.* To this division should be assigned all activities relating to food inspection, abattoir service, dairy inspection service, milk inspection service and general sanitation.

We Recommend:

7. That the dairy inspection service be transferred to the State. The new State law has already made provision for this function. The members of this division may be transferred directly to the State Milk Regulation Board as soon as funds are provided in the supplementary budget.

We Recommend:

8. That a marked curtailment of activities and a reduction in personnel of the Division of Sanitation be made. Most of the activities of this department bear no relationship whatever to protection of the health of the city, are a relic of the past, and are *not public health functions.*

We Recommend:

9. That the Convenience Station service be transferred to some other division of city government. This service is not a function of the Department of Public Health and should not be allocated to its budget.

PUBLIC HEALTH NURSING

The Public Health Nursing Division has a larger personnel and budget than any other division. Nevertheless, the existing staff is not sufficient to carry out the usual volume of public health nursing service for a population of 800,000. This is indicated in the following comparison:

Staff necessary according to the usual volume of public health nursing service for 800,000 people:	1933 staff of public health nurses employed by the City Health Department in Boston.
1 Director and 1 Assistant	1 Director; no Assistant
13 Supervisors	11 Supervisors
131 Staff Nurses	117 Staff Nurses
4 Nutrition Workers	2 Nutrition Workers (2 Assistants)
2 Mental Hygiene Workers	No Mental Hygiene Workers
Clerical—1 clerk for 10-12 nurses	2 Clerks

Despite the fact that Boston does not have adequate public health nursing personnel, we can see no alternative under the existing emergency than to cut the personnel.

We Recommend:

10. A reduction in the nursing personnel of:

2 Supervisors
1 Nutrition Worker
2 Assistant Nutritionists
8 Nurses attached to the Health Centers
7 Field Nurses

The nurses removed from the Health Centers need not necessarily be the persons dismissed. It would seem advisable to reduce the staff first by those persons for whom new positions were created in 1933; secondly, at the discretion of the director remove those persons who give least adequate service and are the least satisfactory. This would hold good in relation to the staff and the supervisors. Another consideration would be naturally those nurses who had other means of support.

LABORATORY

We Recommend:

11. That the salaries of all personnel engaged in laboratory work or related activities be allocated to the Division of Laboratories.

When dairy inspection service is transferred to the State, it may be necessary for the laboratory to do more intensive milk analysis work so that a slight increase in the laboratory budget may be necessary.

HOSPITALIZATION OF TUBERCULOSIS

We Recommend:

12. That no substantial reduction be made in the item for hospitalization of cases of tuberculosis. The present waiting list for hospitalization shows the need for these funds. More intensive clinic work will probably result in a reduction of this item in the very near future.

Committee:

WILSON G. SMILLIE, M.D.,
PROFESSOR CLAIR E. TURNER,
SOPHIE C. NELSON, R.N.

DR. GEORGE W. HAWLEY'S FRACTURE TABLE

The man who twenty years ago invented the world's first orthopedic and fracture table, and whose work has since won him renown throughout the civilized world, has now made an even greater contribution to his fellow man—and he has done it while bedridden at Glockner Sanatorium in Colorado Springs, Colorado.

He is Dr. George W. Hawley of Bridgeport, Conn., who has been decorated by foreign countries and is regarded as one of the world's authorities on fractures. He has been a member of the "fracture committee" of the American College of Surgeons ever since it was created. During the World War he was in charge of America's only bone and joint hospital in France.

Three years ago tuberculosis undermined Dr. Hawley's health and he was sent to Glockner Sanatorium, which is at the base of Pike's Peak. Unable to carry on his practice, he converted his hospital room into a makeshift laboratory and from his bed directed experiments. Engineers traveled across the continent to confer with him in bringing out a new fracture table that combines the x-ray and fluoroscope with it for the first time in medical history.

The table is not yet in general use but it is installed in some of the leading hospitals in India, Belgium, Philadelphia, New York City, Atlanta, Ga.; Sharon, Pa.; Washington, D. C.; Milwaukee, Wis.; Toledo, O.; Waukesha, Wis.; Elmira, N. Y.; Ogden, Utah, and Glockner hospital in Colorado Springs where the original was perfected.

Guesswork in setting fractured bones has been entirely eliminated through the use of the new table, which permits the surgeon to watch and guide the fracture ends during reduction, through the fluoroscope. He is not compelled to manipulate and attempt reduction blindly and then take radiographs to learn whether the operation is complete or a failure. In the past, treatment of fractures required the help of many hands, extravagance of costly dressings and in instances the job had to be done over.

Formerly the patient was subjected to much pain and handling by being moved from the fracture table to the x-ray table. With the new combination table and x-ray the surgeon may take radiographs of any type of fracture at any time during the operation, regardless of the position of the patient. This is possible because of the design of the apparatus and the mobile, shock-proof x-ray unit. There is no danger to the patient, nor the surgeon from possible shock. The table is of steel with top sections of plywood covered with bakelite, permitting free passage of the x-ray and eliminating graining of radiographs.

Doctors say that the new table not only revolutionizes and simplifies handling of fracture cases, but is a more humane and more economical apparatus and procedure.

Dr. Hawley's table that was brought out twenty years ago is now in the Smithsonian Institution, Washington, D. C.

While Dr. Hawley has been at work on the new table he has been cured, seemingly a reward for his effort. He has recently been released from the Colorado Springs Hospital.

CORRESPONDENCE

DIPTHERIA PREVENTION

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

March 21, 1934.

Dear Doctor:

In 1933 there were only 1,041 cases and 86 deaths from diphtheria as contrasted with 9,018 cases and 579 deaths in 1923. Great as may be our satisfaction at this striking reduction, much remains to be done in diphtheria prevention. The greatest opportunity for diphtheria immunization in the future rests in the hands of the family physician. Many physicians today regularly immunize all infants under their care. Were this done routinely by all physicians in the State, diphtheria would soon virtually disappear, and there would be little need for the continuance of public clinics.

May we bespeak your coöperation and interest in this work. The advisability of immunization should be called to the attention of all parents and active immunization with diphtheria toxoid should be recommended as a routine during the latter half of the first year of life. The Department of Public Health urges all boards of health to send a card similar to the enclosed, on the basis of birth records. If your community is not already doing so, we would suggest that you take this up with your board of health. There is enclosed also a table showing the incidence of diphtheria in the larger cities and towns during the past few years. Only by constant effort can the reduction already achieved be maintained.

Very truly yours,

HENRY D. CHADWICK, M.D.,
Commissioner of Public Health;
WILLIAM H. ROBEY, M.D.,
President, Massachusetts Medical Society;
DWIGHT O'HARA, M.D.,
Chairman, Committee of Public Health, Massachusetts Medical Society.

A SAMPLE OF THE CARD

The Commonwealth of Massachusetts
Department of Public Health

Diphtheria Can Be Prevented

The ideal time to protect a child against diphtheria is between the ages of six months and one year. Our records show that your baby is now over six months old. We therefore urge you to take this matter up with your family physician at your earliest opportunity. Every case of diphtheria is unnecessary and could be avoided by immunization.

Board of Health of.....
and
Massachusetts Department of Public Health.

I have immunized against diphtheria. Please bring this child back in six months for a Schick test.

..... M.D.

Date: 193

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DIPHTHERIA CASES REPORTED FROM CITIES AND TOWNS OVER 10,000 POPULATION*

How Does *Your* Community Stand?

City or Town	Population	1927	1928	1929	1930	1931	1932	1933	1933 Case Rate†
Massachusetts	4,318,130	4,750	4,052	4,255	3,322	2,381	1,811	1,041	24.1
Lowell	93,733	191	116	65	21	26	38	71	75.7
New Bedford	108,112	304	258	228	160	118	78	73	67.5
Medford	67,550	34	39	87	47	64	39	41	60.7
Weymouth	23,235	12	8	12	5	8	7	14	60.3
Somerville	107,067	110	143	124	179	119	64	63	58.8
Peabody	22,300	20	13	21	24	57‡	19	12	53.8
Cambridge	109,728	141	246	144	91	53	69	50	45.6
Fairhaven	11,029	16	9	13	15	11	11	5	45.3
Taunton	36,123	12	8	3	5	38	14	16	44.3
Athol	11,375	1	0	1	1	0	16	5	44.0
Salem	43,695	133	70	220	133	60	52	18	41.2
Danvers	13,705	11	4	20	18	4	5	5§	36.5
Chelsea	44,890	31	18	55	56	42	44	16	35.6
Fall River	106,382	141	117	129	117	100	41	34	32.0
Quincy	79,730	54	20	17	7	10	26	25	31.5
Wakefield	16,773	5	8	29	10	2	2	5	29.8
Woburn	20,120	16	37	33	9	9	7	6	29.8
Revere	37,245	55	17	51	29	38	9	11	29.5

Everett	52,515	46	48	106	63	103	47	15	28.6
Lynn	101,829	136	172	195	191	106	57	28	27.5
Worcester	198,270	257	269	125	213	117	102	54	27.2
Attleboro	22,510	23	19	23	6	7	10	6	26.7
Boston	782,205	1,259	898	1,104	862	701	540	207	26.5
Needham	12,051	1	1	3	6	1	3	3	24.9
Haverhill	48,372	78	44	57	72	6	13	12	24.8
Brockton	62,796	30	59	25	23	48	11	15	23.9
Winthrop	17,295	11	8	7	1	4	3	4	23.1
Watertown	41,040	43	25	35	27	23	13	9	21.9
Arlington	43,335	10	15	18	23	8	19	9	20.8
Dedham	15,924	1	5	2	3	1	0	3	18.8
Newton	73,215	25	14	8	3	1	6	13	17.8
Malden	62,080	52	22	91	24	62	22	11	17.7
West Springfield	17,560	39	42	10	6	0	1	3	17.1
Plymouth	12,958	7	10	3	11	9	3	2	15.4
Wellesley	12,985	1	3	2	1	0	10	2	15.4
North Adams	20,915	9	8	1	2	1	0	3	14.3
Gloucester	24,735	21	24	14	2	3	1	3	12.1
Milton	18,750	6	5	0	4	3	3	2	10.7
North Attleboro	10,455	45	22	0	0	0	0	1	9.6
Reading	10,463	4	0	2	17	1	1	1	9.6
Lexington	10,555	5	0	1	7	3	10	1	9.5
Waltham	42,171	87	38	13	4	4	15	4	9.5
Swampscott	11,249	13	29	11	6	5	5	1	8.9
Adams	12,161	37	8	10	17	11	6	1	8.2
Northampton	24,530	14	13	12	45‖	4	2	2¶	8.2
Amesbury	12,330	0	2	15	10	11	1	1	8.1
Belmont	25,955	23	21	11	6	11	6	2	7.7
Newburyport	14,735	0	2	57	84	13	14	1	6.8
Chicopee	45,255	51	31	40	21	20	8	3	6.6
Marlboro	15,168	61	17	6	2	4	13	1	6.6
Saugus	15,970	10	36	7	6	6	1	1	6.3
Braintree	17,340	3	9	7	5	4	2	1	5.8
Springfield	154,970	256	348	268	133	39	17	9	5.8
Holyoke	54,070	45	62	36	5	3	2	3	5.5
Fitchburg	38,798	36	27	64	16	10	11	2	5.2
Gardner	19,830	1	4	2	3	1	0	1	5.0
Pittsfield	51,486	16	31	54	8	2	2	2	3.9
Beverly	26,645	20	5	18	44	7	3	1	3.8
Lawrence	79,614	35	41	31	16	13	3	3	3.8
Brookline	50,613	8	4	5	16	9	7	1	2.0
Clinton	11,930	2	1	1	0	1	1	0	0.0
Easthampton	11,152	2	1	10	2	0	0	0	0.0
Framingham	22,935	7	1	6	3	0	2	0	0.0
Greenfield	15,660	14	28	9	5	4	2	0	0.0
Leominster	21,612	43	0	2	3	0	13	0	0.0
Melrose	25,120	5	15	10	10	8	14	0	0.0
Methuen	21,365	8	8	4	4	2	2	0	0.0
Milford	14,718	2	13	10	1	1	3	0	0.0
Natick	14,047	20	6	2	3	2	0	0	0.0
Norwood	15,625	3	2	3	5	2	2	0	0.0
Southbridge	13,471	14	13	9	2	0	5	0	0.0
Stoneham	10,690	2	1	14	10	2	1	0	0.0
Webster	12,735	4	1	13	1	0	2	0	0.0
Westfield	20,054	80	23	10	7	2	0	0	0.0
Winchester	13,465	2	5	6	7	18	5	0	0.0

*Estimated as of July 1, 1933.
†Case rate per 100,000 population.
‡Included 25 cases which occurred in a short outbreak in a single school.
§All cases in State Hospital.
‖Included 39 cases at State Hospital.
¶One case in State Hospital.

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
March 31, 1934.

Managing Editor,
The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of March 3, the following have been accepted:

Don Baxter Intravenous Products Corporation
- Sterile 2½% Dextrose in Physiological Sodium Chloride Solution in Vacoliter Container
- Sterile 5% Dextrose in Physiological Sodium Chloride Solution in Vacoliter Container
- Sterile 7½% Dextrose in Physiological Sodium Chloride Solution in Vacoliter Container
- Sterile 10% Dextrose in Physiological Sodium Chloride Solution in Vacoliter Container

Eli Lilly & Co.
- Solution Liver Extract Concentrated—Lilly
- Ampoules Solution Liver Extract Concentrated—Lilly, 10 cc.

G. D. Searle & Co.
- Tablets Procaine Borate Without Epinephrine

Sharp & Dohme, Inc.
- Antipneumococcic Serum, Types I and II Combined—Mulford
- Antipneumococcic Serum, Concentrated (Pneumococcus Antibody Globulin, Types I and II)—Mulford
- Diphtheria Toxoid, Alum Precipitated (Refined)
- Live Oak Pollen Extract—Mulford; Red Clover Pollen Extract—Mulford; Sweet Clover Pollen Extract—Mulford; Southern Ragweed Pollen Extract—Mulford.

Yours very truly,
PAUL NICHOLAS LEECH, *Secretary,*
Council on Pharmacy and Chemistry.

RECENT DEATHS

PERRY—MARTHA PERRY, M.D., died in New Bedford, March 29, 1934, at the age of ninety-three years. She graduated from Mt. Holyoke, and the Woman's Medical College of Pennsylvania where she served as an interne.

Dr. Perry joined the Massachusetts Medical Society in 1885 and retired in 1913.

During her thirty-five years of practice in Taunton, she served as trustee, clerk, and member of the Staff of the Morton Hospital.

Dr. Perry was a member of the Congregational Church and was active in civic affairs.

Burial was at West Yarmouth.

SOLBY—IRVING SOLBY, M.D., of 235 Chestnut Hill Avenue, Brighton, Massachusetts, died suddenly, March 26, 1934. He was a native of Northampton, Massachusetts, a graduate of Amherst College and from the Harvard University Medical School in 1907. He retired from practice several years ago and engaged in business. He joined the Massachusetts Medical Society in 1908 under the name of Sobotky and retired in 1924. He is survived by his widow, Mrs. Wilhelmina Solby, and his mother, Mrs. Rose Sobotky.

McGAURAN—MICHAEL SHERIDAN MCGAURAN, M.D., of Lawrence, Massachusetts, died March 25, 1934. He was born in 1847. He graduated in medicine from the Rush Medical College of Chicago in 1888. He joined the Massachusetts Medical Society in 1891 and retired in 1927.

His interest in local organizations is shown by the following designated bequests in his will: St. Mary's Parochial School, Lawrence, $1000 for prizes; Salvation Army, Lawrence, $200; Working Boys' Home, Newton, $1000; Lawrence Orphan Asylum, $1000.

OBITUARY

L. MAUD CARVILL, M.D.

In the recent death of Dr. L. Maud Carvill the community has lost a skilled ophthalmologist and a noble woman. Herself the daughter of a physician, she carried on the old tradition which makes the practice of medicine a career of self-sacrifice.

She graduated from the Sargent Normal School of Physical Training in 1895, receiving her A.B. from Tufts College in 1899, and her M.D. from the same college in 1905. She rose rapidly in her chosen specialty and became an assistant surgeon in ophthalmology at the Massachusetts Eye and Ear Infirmary and the Massachusetts General Hospital. From this position she retired a year ago. She served also as Visiting Ophthalmologist to the New England Hospital for Women and Children for over twenty years, retiring in 1929 to become a consultant.

She belonged to such general organizations as the New England Women's Medical Society, the Massachusetts Medical Society, and the American Medical Association. Of the societies demanding special training and achievement, she held membership in the New England Ophthalmological Society, the American College of Surgeons, the American Academy of Ophthalmology and Otolaryngology, and the American Ophthalmological Society. Of the last-named society she was the only woman member, winning admission by a thesis on glaucoma. Through this paper she became nationally recognized as an authority on the subject. She is cited as one of the American authorities on two other subjects as well; interstitial keratitis and tuberculosis of the eye. At the International Congress of Ophthalmologists in Washington in 1922 she presented a paper entitled "Bitemporal Contraction of the Visual Fields in Pregnancy," a contribution which has become a classic in the subject in Europe as well as America. Minor articles of hers are entitled "A Contribution to the Study of Phlyctenular Keratitis" and "Persistent Hyaloid Artery." From

the material of an arduous practice she was constantly drawing conclusions and publishing them as scientific papers. As a result of these labors she has been estimated by a noted colleague as the most outstanding American woman of her generation in ophthalmological research.

Dr. Carvill would have found herself appalled in the presence of this summary of her achievements, for she suffered from a painful modesty which minimized the value of whatever she did. Reticence pervaded all the deeper ranges of her life; in religion, in friendship, in family relations. She was a woman of more deeds than words. A touch of Puritan austerity demanded nothing short of the best, of herself and everyone else, but it was mellowed by humor and a great kindliness. Her total honesty in the face of facts made her essentially a scientist; but she was always, as well, a ministering physician. For six months she faced imminent death with entire fortitude, asking only to be spared long enough to complete her immediate tasks. This was granted her.

To a host of patients Dr. Carvill leaves the fragrance of a grateful memory. For her associates in medicine, she lays on their personal loss the healing touch of a desire for better work and more exacting living.

NOTICES

A CLINIC ON PNEUMONIA

On Thursday afternoon, April 26, at 3:30 P.M., in the amphitheater of the Peter Bent Brigham Hospital, Dr. Alfred Stengel, Professor of Medicine, and Vice President in charge of Medical Affairs at the University of Pennsylvania, Physician-in-Chief, *pro tempore* at the Peter Bent Brigham Hospital, will give a clinic on pneumothorax in the treatment of pneumonia. Students of medicine and practicing physicians are invited to attend.

HENRY A. CHRISTIAN, M.D.

THE AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY

EXAMINATIONS FOR CERTIFICATES

The American Board of Dermatology and Syphilology will hold written examinations for candidates for a certificate on April 30, 1934, in the following cities: New York City; St. Louis, Mo.; Boston, Mass.; Cleveland, Ohio; San Francisco, Calif.; Philadelphia, Pa.; and Chicago, Ill.

If a sufficient number of applicants register for the examination from other districts, additional examinations will be held in other cities. This examination will be for applicants in both Group A and Group B.

The oral examination for both Group A and Group B will be held in Cleveland, Ohio, June 11 and 12, at the time of the American Medical Association meeting.

Further information may be obtained from the Secretary, Dr. C. Guy Lane, 416 Marlboro Street, Boston, Mass.

PHYSICIANS' ART EXHIBIT

The Exhibit will open on Monday, April 23, at the Boston Medical Library and continue through Saturday, May 5. The hours will be from 10 A.M. to 6 P.M. daily and 7 to 10 P.M. on Monday and Wednesday evenings.

Great interest is being shown in the exhibit and more pictures and models have been received than it will be possible to hang or display.

Through the kindness of an anonymous donor who is greatly interested in the advancement of art among the members of the medical profession, an award will be made for the best example of creative art. The award will be made by a committee of well-known Boston artists who will also make selections for the exhibit to be held in October at the time of the meeting of the American College of Surgeons.

REPORT AND NOTICES OF MEETINGS

NEW ENGLAND HEART ASSOCIATION

The New England Heart Association held a meeting on Monday, March 26, in the Evans Auditorium of the Massachusetts Memorial Hospitals with Dr. W. D. Reid presiding.

The program began with a talk by Dr. George Levene on the roentgenologic diagnosis of coronary disease. The left ventricle is measured by a line extending from the auriculoventricular junction to the apex of the heart. A perpendicular to this line, erected at the point of greatest curve of the left heart border, shows the thickness of the left ventricular myocardium, which normally measures between eight and ten millimeters. This thickness is due to the amount and tone of the heart muscle.

The circumflex and anterior descending branches of the left coronary artery are the ones most frequently and extensively involved. Since these are distributed to that portion of the heart muscle which forms its left contour, disease of these vessels readily manifests itself by changes in the appearance and activity of the left border.

The thickness of the left ventricular myocardium becomes diminished, due to a loss of tone and frequently to degeneration of the muscle fibers. The heart appears to sag. Fluoroscopically, the amplitude of pulsations is greatly diminished and when infarction is present, the amplitude of pulsations in the ventricle is weaker than those of the auricle. These findings have frequently enabled the speaker to diagnose coronary disease without any clinical knowledge of the patient. Demonstration of calci-

fication of the coronary arteries is a diagnostic point of lesser importance, since it occurs infrequently and too late to be of practical clinical value.

Dr. Richard J. Wagner presented a paper with lantern slides on carbohydrate metabolism in hypertension. This is part of a metabolic study now in progress at the Evans Memorial. Liver function was found disturbed in 80 per cent of the cases presented. Ten per cent of the cases showed a diabetic sugar tolerance curve. In 46 per cent of the hypertension cases the specific dynamic effect of carbohydrates was not present. In these cases the oxygen consumption did not rise after 100 Gm. of sugar were given, but remained practically at the basal level, whereas in the remaining 44 per cent of all cases, the specific dynamic effect was present as in normal individuals, and a rise of the oxygen consumption after the sugar test meal from 300 to 800 calories was determined. The blood pressure declined in most of the cases of the group without specific dynamic effect from 20 to 80 mm. systolic and 10 to 40 mm. diastolic. In the group with normal response to the sugar stimulus only a small percentage did show a drop of the pressure. An increase of the urinary nitrogen output was observed in most of the cases without pressure response to the sugar meal. In the cases without pressure response the nitrogen output remained constant or was somewhat decreased. His work shows that the carbohydrate metabolism plays an important rôle in diseases which have hypertension as one symptom.

Dr. Walter Mendenhall, professor of pharmacology of the Boston University Medical School, talked on certain drugs included in the curriculum but rarely used by the medical profession. These drugs included veratrum, salol, picrotoxin, pilocarpine, and curare. Veratrum has never been used to any great extent yet it is known to be a stimulant of the vagus center and can be given in doses that are not toxic. Salol, he believes, deserves to be tried in rheumatic fever and muscular pains as it contains salicylates in a form not irritating to the stomach. Pilocarpine, a stimulant of the autonomic system, could be used more to moisten the mucous membranes and to remove fluids in cases of generalized edema. Picrotoxin until recently was seldom if ever used, but today it is used a great deal in the treatment of sodium amytal poisoning.

Dr. Samuel H. Caldwell of the Department of Electrical Engineering at the Massachusetts Institute of Technology gave a demonstration lecture on electric oscillations and their significance in electrocardiography. He stated that the waves in an electrocardiogram are the summation of a number of waves. In other words, each wave can be broken down into a fundamental wave and a series of harmonics, or higher frequency waves related to the fundamental one. The analysis of a typical wave into its components was demonstrated. Such analysis discloses the presence of frequencies far in excess of those that the string galvanometer, as used in clinical electrocardiography, is capable of recording. The need, therefore, for apparatus that is capable of recording faithfully these high frequencies is obvious.

Dr. Caldwell concluded his talk by operating a cathode ray oscillograph to demonstrate visibly the shape and composition of certain electrical waves. It was suggested that the cathode ray oscillograph has important application in laboratories devoted to medical science.

The meeting was concluded by a demonstration of the "Mechanical Hearts" invented by Dr. George Levene. These working models show the heart as it actually appears under the fluoroscope. The display included the normal heart, more common arrhythmias, valvular lesions, thyrotoxicosis, and coronary disease. The device should be of great value in teaching and demonstrating heart disease.

MASSACHUSETTS PSYCHIATRIC SOCIETY

The next meeting of the Massachusetts Psychiatric Society will be held on Friday evening, April 20, at the Boston Psychopathic Hospital at 8 P.M.

The scientific program is to be as follows:

"The Effects of the Alteration of Posture on the Cerebrospinal Fluid Pressure." Dr. Julius Loman.

"Mental Disease in a Tuberculosis Sanitarium Population." Dr. Clifford Moore.

OSCAR J. RAEDER, M.D., *Secretary.*

SUFFOLK DISTRICT MEDICAL SOCIETY

CENSORS' MEETING

The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Boston Medical Library, No. 8 The Fenway, Thursday, May 3, 1934, at 4:00 o'clock.

Candidates should make personal application to the Secretary, and present their medical diploma at least one week before the examination.

GEORGE P. REYNOLDS, M.D., *Secretary.*
311 Beacon Street, Boston.

HARVARD MEDICAL SOCIETY

POSTPONEMENT OF MEETING

The meeting of the Harvard Medical Society, scheduled for April 24, to be addressed by Dr. James C. White, has been postponed to May 8. Notice with title will appear later.

JOHN HOMANS, M.D., *Secretary.*

HOUSE OFFICERS' ASSOCIATION OF THE BOSTON CITY HOSPITAL

Monday, April 23, 1934
Subject: Gynaecology

8:00 P.M. Presentation of Cases.

8:15 P.M. "What Should Be the Attitude of the Beginning Practitioner of Medicine Toward the Practice of Obstetrics." Frederick L. Good, M.D.

8:35 P.M. "Endometriosis." Frank A. Pemberton, M.D.

8:55 P.M. "The Modern Understanding of Human Infertility." Samuel R. Meaker, M.D.

9:15 P.M. "Gonorrhea in Women as a Clinical Entity." Alonzo K. Paine, M.D.

This meeting will be held at the Thorndike Amphitheatre at the Boston City Hospital.

ROBERT T. PHILLIPS, M.D., *Secretary.*

NEW ENGLAND PHYSICAL THERAPY SOCIETY

The regular meeting of the New England Physical Therapy Society will be held, through the courtesy of Dr. Herbert E. Herrin, Superintendent, in the Lecture Hall of the Psychiatric Clinic, Boston State Hospital, at 7:45 P.M., April 24, 1934.

The program is in charge of Dr. Rebekah Wright, Hydrotherapist, Massachusetts Department of Mental Diseases.

PROGRAM

Hydrotherapy. Rebekah Wright, M.D., Boston.

The Superintendents of three Massachusetts State Hospitals will speak briefly on:

The Continuous Bath. Ralph M. Chambers, M.D., Taunton.

The Wet Sheet Pack. Edward W. Whitney, M.D., Northampton.

Colonic Irrigation. Charles E. Thompson, M.D., Gardner.

After a demonstration in the hydrotherapy suite, the members and guests will be shown the other physical therapy facilities of the Clinic and will return to the Lecture Hall for discussion.

At 7:30 o'clock, prior to the program, there will be a meeting of the Council. Councilors are urged to arrive promptly as nominations for officers of the Society will be made at this meeting.

All members of the medical profession are cordially invited to be present and to participate in the discussion.

ARTHUR H. RING, M.D., *Secretary*

HAMPDEN DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Society will be held at Hotel Kimball, Springfield, on Tuesday, April 24, 1934, at 4 P.M.

Regular business and election of officers for the ensuing year.

Paper for the afternoon: "The Neuroses as the General Practitioner Meets Them." Dr. Abraham Myerson of Boston.

Discussion by Fellows.

Dinner at 6 P.M. at expense of Society.

HERVEY L. SMITH, *Secretary and Treasurer.*

Censors meet for examination of candidates for admission to the Society in the rooms of the Springfield Academy of Medicine, 20 Maple Street, Springfield, on Thursday, May 3, at 4 P.M.

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The annual meeting of the Worcester North District Medical Society will be held at the Burbank Hospital, Fitchburg, Mass., on Wednesday, April 25, at one o'clock P.M. Dr. Andrew R. MacAusland of Boston will deliver the annual oration on "Recent Trends in the Treatment of Fractures." Officers for the year will be elected. Dinner will be furnished by the hospital management.

FRANCIS M. MCMURRAY, M.D., *Secretary.*

PHI DELTA EPSILON FRATERNITY

A late notice appears on page 882.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

April 20 and 27—Salmon Memorial Lectures. See page 443, issue of February 22.

April 20—New England Roentgen Ray Society will meet at the Beth Israel Hospital at 8:15 P.M.

April 20—Massachusetts Psychiatric Society. See page 878.

April 23—Phi Delta Epsilon Fraternity. See page 882.

April 23—New England Heart Association will meet in the Assembly Room of the House of the Good Samaritan, at 8:15 P.M.

April 23—House Officers' Association of the Boston City Hospital. See page 878.

April 23 - May 5—Physicians' Art Exhibit at the Boston Medical Library, 8 The Fenway. See page 877.

April 24—New England Physical Therapy Society. See notice elsewhere on this page.

April 26—A Clinic on Pneumonia. See page 877.

April 27—New England Society of Psychiatry will meet at the Boston State Hospital, Dorchester Center, Mass., at 1 P.M.

April 30—The American Board of Dermatology and Syphilology. Examinations for Certificates. See page 877.

May 3—Faulkner Hospital Clinical Meeting will be held at 5 P.M.

May 14, 15, 16, and 17—Thirtieth Annual Meeting of the National Tuberculosis Association. For details apply to the National Tuberculosis Association, 450 Seventh Avenue, New York City.

May 26, 27, 28, and 29—The American Association on Mental Deficiency. Details may be obtained from the Secretary, Dr. Groves B. Smith, Godfrey, Illinois.

June 12—American Heart Association will meet at 9:30 A.M. at the Cleveland Hotel, Cleveland, Ohio.

July 24-31—The IVth International Congress of Radiology will be held in Zurich under the presidency of Professor H. R. Schniz. General Secretary Dr. H. E. Walther, Gloriastrasse 14, Zurich.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

DISTRICT MEDICAL SOCIETIES

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Thursday, May 3—Censors' Meeting, at Salem Hospital, 3:30 P.M.

Tuesday, May 8—Annual Meeting. Salem Country Club, Forrest Street, Peabody. Dinner at 7. Speaker to be announced. Subject to be announced.

RALPH E. STONE, M.D., Secretary.
221 Cabot Street, Beverly, Mass.

FRANKLIN DISTRICT MEDICAL SOCIETY

The next meeting will be held on the second Tuesday of May at the Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.
Sunderland, Mass.

HAMPDEN DISTRICT MEDICAL SOCIETY

April 24—See notice elsewhere on this page.

May 3—Censors' Meeting. See notice elsewhere on this page.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The next meeting will take place in May (2nd Wednesday) at Winchester.

ALLAN R. CUNNINGHAM, M.D., Secretary.
76 Church Street, Winchester, Mass.

MIDDLESEX NORTH DISTRICT MEDICAL SOCIETY

Meeting will be held on April 25.

T. A. STAMAS, M.D., Secretary.
226 Central Street, Lowell, Mass.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

May 3—Censors' Meeting will be held at the Boston Medical Library, 8 Fenway, Boston.

NORFOLK DISTRICT MEDICAL SOCIETY

May—Annual Meeting. Time, place and program to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.
1695 Beacon Street, Brookline, Mass.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

May 3—12 noon at Norfolk County Hospital. Annual Meeting. Election of Officers.

N. R. PILLSBURY, M.D., Secretary.
Norfolk County Hospital, South Braintree, Mass.

SUFFOLK DISTRICT MEDICAL SOCIETY

April 25—Annual Meeting at the Boston Medical Library. Election of Officers. Scientific Program. Speaker, Dr. Abraham Myerson. Subject, "Responsibility."

May 3—Censors' Meeting. See page 878.

JAMES H. MEANS, M.D., Vice-President.
GEORGE P. REYNOLDS, M.D., Secretary,
311 Beacon Street, Boston, Mass.

WORCESTER DISTRICT MEDICAL SOCIETY

Meeting to be held on Wednesday as follows:

May 9—Annual Meeting. Time and place to be announced later.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester, Mass.

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

April 25—See page 879.

BOOK REVIEWS

Infections of the Hand. A guide to the surgical treatment of acute and chronic suppurative process in the fingers, hand, and forearm. By Allen B. Kanavel. Published by Lea & Febiger. Sixth edition. 552 Pages. Price $6.00.

In the sixth edition of this classic contribution on hand infections, Kanavel has not only revised the subject matter and added considerable new material, but has entirely rearranged its presentation. All expositions of methods of study, of anatomy, and of general principles have been assembled in Part I. Two new chapters on the function of the hand in relation to infections and on prophylactic treatment of injuries have been added. Parts II and III are clinical considerations of various phases of the subject and Part IV of complications, sequelae, and after-treatment. To Part II on localized infections, such as felons, paronychia, carbuncles, minor space abscesses, has been added new material on indelible pencil injuries; milker's nodules; differential diagnosis of chancre, tularemia, sporotrichosis, coccidioidal granuloma, blastomycosis, actinomycosis, oriental boil and anthrax; infections about metacarpophalangeal joints and human bites. All material on gangrenous infections has been assembled in one chapter, much of which is new. In Part IV, in addition to a thorough revision of former subject matter, is additional information on edema following infections and the use of splints after infections. In the fifth edition there were 196 illustrations. In the present edition there are 216. Some of the previous illustrations have been consolidated in single engravings, others have been omitted. Still others have been clarified and some new ones added from the hand of Mr. Tom Jones.

The physical make-up of the book is attractive with heavy boards and buckram, beautiful typography, and calendered paper which enhances the definition of the engravings.

Though other editions of this work, which has done more than any other contribution to place the subject on an intelligent and scientific basis, may be on the shelves of medical students, general practitioners, surgeons, and medical and hospital libraries, this sixth edition has been so thoroughly revised and augmented that it is necessary to discard the old and secure the new.

Manual of Urology. By R. M. LeComte. Published by William Wood & Company. 1256 Pages. Price $7.50.

This manual of urology is well written, and contains the fundamentals of diseases of the genitourinary tract. It is short, concise, and well adapted for use by medical students, and nurses. Each disease is adequately described with its underlying pathology, symptomatology, differential diagnosis, course, prognosis and treatment. It is to be expected that in so brief a manual many fine points of diagnosis, treatment and pathology are necessarily omitted.

The author states that hypernephromata are the most common renal epithelial tumors in adults. It is the reviewer's opinion that renal cell adenocarcinomata are by far the most common renal neoplasm found in adults.

In classifying the causes of polyuria, the author fails to mention infectious diseases as one of the common causes.

Diseases of the Nervous System. By W. Russell Brain. Oxford Medical Publications, Oxford University Press, London: Humphrey Milford, 1933. 899 Pages.

There are many textbooks of neurology and some of the older ones are still of great value. Nothing has ever been written to compare with Oppenheim's two volumes, translated into English from the fifth edition in 1911. Even earlier is the splendid book by Gowers, giving his personal experiences as the result of many years' practice in neurology. Both of these books are standard and all subsequent publications must necessarily be compared with them.

The book at hand for review is of a somewhat dif-

ferent character. It lacks the personal element found in the great neurological textbooks noted above. It does, however, give the neurologist the benefit of an excellent summary of the more recent additions to the subject. It is, perhaps, a little technical for the average general practitioner, but, accurately written, one could hardly fail to obtain excellent information from a book of this type, even though he had little experience with neurology. For the specialist the book does not add anything particularly new, although it will serve as a convenient reference to the more recent literature, particularly on account of the extensive bibliography which is appended. Carefully produced, with a few well-chosen illustrations, this book is a distinct addition to the neurological field and both the author and the publisher deserve credit for embarking upon such an extensive adventure in these troublesome times.

Collected Papers of The Mayo Clinic and The Mayo Foundation. Edited by Mrs. Maud H. Mellish-Wilson and Richard M. Hewitt. Volume XXIV, 1932. Published by W. B. Saunders Company. 1205 Pages. Price $11.50.

This, the twenty-fourth consecutive volume of the "*Collected Papers*," contains ninety-nine full reprints of articles covering subjects of interest to the general surgeon, the internist and specialist. A tremendous field is covered by the list of titles in the literature enriched by the Rochester group, ranging from Rosenow's important work in poliomyelitis to the sage conclusions of Alvarez, a master physiologist and clinician.

A great mass of material is marshalled, based on a wealth of clinical material. The reader can but note in these papers the same features that impress the visitor to the clinic itself, enthusiasm, sympathy, and the highest standards of scientific investigation. The preëminent work of Adson in neurosurgery, of Desjardins in radiotherapy, and Eusterman in gastroenterology are evident in these papers. The always interesting and worth while comments of the Senior Mayo, on medicine as a science and as an art, can never be extravagantly expressed.

Clinical experience, experimental research, critical judgment and thoroughness always characterize Mayo publications. They make this book a valuable addition each year to the library of the progressive physician.

The Surgical Clinics of North America. December, 1933, Volume 13, Number 6. Pacific Coast Surgical Association Number and Index Number. W. B. Saunders Company, Philadelphia.

This issue is composed of contributions from thirty-seven members of the Pacific Coast Surgical Association. The unusually large number of clinics covers a wide range of subjects but consists chiefly in rather brief reports of interesting cases. The reviewer feels that those numbers that deal with fewer topics, but discuss them more thoroughly, are of greater practical value.

The Science of Human Reproduction. By H. M. Parshley. Published by W. W. Norton & Company, Inc., New York. 319 Pages. Price $3.50.

Professor Parshley's book is a thoroughly satisfactory presentation of the facts, so far as they are known today, concerned with human reproduction. Its purpose is twofold — "first, to answer most of the questions that non-professional students and intelligent laymen are likely to ask about the anatomy and physiology of human procreation; and secondly, to provide the biological basis for a scientific attitude toward sex and its problems".

This purpose is admirably fulfilled. The author has selected the essential facts and has presented them clearly and with sufficient but not too great detail. The philosophical significance of conditions is kept constantly before the reader, and his interest is increased by the fact that not infrequently the author slips in a subtle bit of humor or some pertinent reference to conditions of modern civilization.

Although every part of this book is well done, the reviewer was especially impressed by the clarity of the discussion concerning those hormones that affect the sexual development of the individual and that influence the sexual cycle in women. The last two sections of the book, "Population and Eugenics" and "The Biology of Sex Behavior," are as sound a discussion of these phases of human reproduction as the reviewer has seen.

The book cannot be summarized; those who are interested in this most vital subject should read it for themselves.

Public Health Nursing in Industry. By Violet H. Hodgson. Published by The Macmillan Company. 249 Pages. Price $1.75.

The author states that "the aim of this publication is to indicate the potential field of public health nursing in commerce, trade and industry". Apparently this is another way of saying that it is intended to point out the possibilities of extending the field of employment for registered nurses. The book would seem to be well calculated to serve this purpose.

In connection with its object also certain biological and medical truths are presented in a way that deserves commendation. The following may be cited as an example:

> "Nutrition and food are not synonymous. Sufficient food is essential to nutrition, but rarely is good nutrition dependent entirely upon food intake."

Important truths well stated, platitudes relative to the value of health, unqualified assertions regarding conditions of disputed pathology and dogmatic prescriptions in the matter of the care of specified conditions are, however, so interwoven as to make one wish that in connection with the arrangement of the subject matter and its presentation the

author might have had the benefit of a broad medical education and a clearer appreciation of the limitations of human knowledge.

The Surgical Clinics of North America. Volume 13, Number 5. October, 1933. Chicago Number. Published by W. B. Saunders Company. Issued serially, one number every other month. Octavo of 254 pages with 93 illustrations. Per clinic year, February 1933 to December 1933. Price, Paper $12.00; Cloth, $16.00 net.

The outstanding feature of this issue is a symposium on surgical operations on children given by eight of Chicago's leading surgeons. The subjects covered in this group are intracranial tumors, mastoiditis, cystic tumors of the neck, acute empyema, pyloric stenosis, intussusception, the urinary tract, and congenital dislocation of the hip.

Bevan reports remarkable results following the use of x-ray for an advanced papillary cystadenocarcinoma of the ovary.

An excellent brief account of everyday knee injuries is presented by Kellogg Speed.

Other clinics offer able discussions of a wide range of conditions of practical interest.

Les Arachnoidtes Spinales Adhésives. By Dem. Paulian and D. Turnesco. Paris: Masson et Cie, 1933. 95 Pages. 8 plates. Price 24 francs.

Adhesive spinal arachnoiditis is a rare disease. The authors have collected twenty-one cases and have given a detailed account of the whole subject. The etiology is often cerebrospinal meningitis, but other causes have been ascertained, for the condition has followed grippe, typhoid fever, gonococcus infection, or even appendicitis. It is occasionally associated with myelitis or radiculitis. Trauma has played a rôle in some cases. The diagnosis is made almost certain by the injection of lipiodol into the spinal canal. The treatment is operative.

The book gives a clear account of the condition, the literature is adequately reviewed, and there are some excellent pictures showing the appearance of lipiodol in the subarachnoid space. In general, one feels that this is a valuable monograph on a relatively little known subject.

Blood Pictures. An Introduction to Clinical Haematology. By Cecil Price-Jones. Third Edition. Published by William Wood & Company. Baltimore. 72 Pages. Price $2.40.

This is a somewhat revised third edition of a book by a well-known English haematologist, the first edition of which appeared in 1917. It is small, compact, and the material is well arranged. It will be found to have less appeal for American readers in view of the fact that methods of blood counting and staining adopted by English haematologists do not coincide with those methods in general use in this country. Many of the methods still used by the English have been improved upon, in the last few years, particularly since the stimulation given to haematology by the discovery of the therapeutic value of liver and liver extract. There are six black and white illustrations and five colored plates.

BOOKS RECEIVED FOR REVIEW

Laboratory Medicine. A guide for students and practitioners by Daniel Nicholson. Published by Lea & Febiger. Second Edition. 566 Pages. Price $6.50.

Annals of the Pickett-Thomson Research Laboratory. Monograph XVI, Part I. Influenza. By David Thomson and Robert Thomson. Published by William Wood & Company, Baltimore: Baillière, Tindall and Cox, London; 640 Pages. December 1933 issue.

Contagious Diseases. What They Are, and How to Deal with Them by W. W. Bauer. First Edition. Published by Alfred A. Knopf. 218 Pages. Price $2.00.

British Spas, Inland and Seaside Resorts, Including New Zealand, South Africa and Canada. 1934. Official Handbook of the British Health Resorts Association. Published by William Wood & Company, Baltimore: J. & A. Churchill, London; 260 Pages. Price 1/.

Hypertension and Nephritis by Arthur M. Fishberg. Third Edition, thoroughly revised. Published by Lea & Febiger. 668 Pages. Price $6.50.

The Single Woman. A Medical Study in Sex Education by Robert Latou Dickinson and Lura Beam. Published by The Williams & Wilkins Company. 469 Pages.

A Text-Book of Gynaecology. For students and practitioners. By James Young. Third Edition. Published by The Macmillan Company. 411 Pages. Price $3.75.

Treatment in General Practice by Harry Beckman. Second Edition. Published by W. B. Saunders Company, 1934. 889 Pages. Price, Cloth, $10.00.

A LATE NOTICE

PHI DELTA EPSILON FRATERNITY

On Monday, April 23, at 8 P.M., the Phi Delta Epsilon Fraternity of Boston University School of Medicine will hold another of its open meetings at the Evans Memorial Hospital Auditorium, 80 East Concord Street, Boston.

Dr. Frank M. Lahey, of the Lahey Clinic, will speak on "Thyroid Disease, Its Diagnosis and Management" and Dr. Lewis M. Hurxthal, of the Lahey Clinic, will talk on "Myxedema, Hypometabolism, and Blood Cholesterol." Dr. Allan Winter Rowe, Director of Clinical Research of the Evans Memorial Hospital, will lead the discussion.